



Alberta Environment and Parks (AEP)
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December 13, 2017

Subject: Monthly Report Submission for the LICA Cold Lake South station

Lakeland Industry & Community Association (LICA) is pleased to submit the ambient air monitoring monthly report for the LICA Cold Lake South AQM Station in the month of October 2017.

The air monitoring program consists of continuous air monitoring, passive sampling, intermittent sampling, including both VOC and PAH sampling program, and VOC canister sampling program. All the air monitoring activities were conducted by contractors.

Sampling Program	Monitoring Activities Conducted By	Sample Analysis Conducted By	Data/Report Review and Prepared By	Electronic Submission Conducted By
Continuous ambient air	Maxxam Analytics	Maxxam Analytics	Maxxam Analytics	Maxxam Analytics
Passive	Maxxam Analytics	Maxxam Analytics	Maxxam Analytics	Maxxam Analytics
Intermittent	Maxxam Analytics	InnoTech Alberta Inc	InnoTech Alberta Inc	Not Applicable
VOC Canister	Maxxam Analytics	InnoTech Alberta Inc	InnoTech Alberta Inc	Not Applicable

The operational time for all continuous ambient air analyzers, meteorological systems and data acquisition systems were above the 90% requirement.

All data collected in October 2017 was compliant with the requirements outlined in the Air Monitoring Directive (Alberta Environment and Parks, 2016).

As the LICA Environmental Program Manager and Data & Reporting Specialist, we certify that we have reviewed and verified this report and that the information is complete, accurate and representative of the monitoring results, reporting timeframe and the specified analysis, summarization and reporting requirements. We also certify all air data that are required by the AMD to be electronically submitted to AEP and Alberta's Ambient Air Quality Data Warehouse have been submitted by the time of this report submission, with the exception of electronic submission for the results of passive samples, intermittent samples and VOC canister samples. The results for both intermittent samples and VOC canister samples is scheduled to be submitted by the end of January 2018.

Should you have any questions, please don't hesitate to contact us.



Lakeland Industry & Community Association
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Respectfully,

A handwritten signature in blue ink that reads "Michael Bisaga".

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AMBIENT AIR MONITORING MONTHLY DATA REPORT
LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
COLD LAKE CONTINUOUS MONITORING STATION

JOB #: 2833-2017-10-1-C

October 2017

Prepared for:

LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
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Attention: MIKE BISAGA

DATE: **November 29, 2017**

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SUMMARY

In October 2017, Maxxam Analytics was contracted to manage the ambient air quality monitoring and maintenance activities at the Cold Lake Continuous Monitoring Station, near Bonnyville, Alberta. The monitoring station provides continuous meteorological measurements and air quality data for non-compliance parameters, as requested by the Lakeland Industry & Community Association.

All data collected this month was compliant with the requirements outlined in the Air Monitoring Directive (Alberta Environment and Parks, 2016).

The operational time for all continuous ambient air analyzers, meteorological systems and data acquisition systems were above the 90% requirement.

- **THC:** Seven hours of downtime were recorded due to additional zero-span checks and a repeat calibration performed between October 26 and October 30 to address an instability in zero response.
- **Ozone:** Six hours of downtime were recorded due to additional quality checks performed between October 25 and October 26 to address a malfunction in the zero-span system.

The summary of results is presented on the following pages.

Any deviations or modifications made to the sampling or analytical methods are outlined in Section 1.0, Discussion. On this basis, Maxxam Analytics is issuing this completed report to Lakeland Industry & Community Association, Cold Lake Continuous Monitoring Station.

Should you have any questions concerning the results or if we can be of further assistance, please contact us at 403-219-3677 or toll-free at 1-800-386-7247.

Monthly Continuous Data Summary

Lakeland Industry & Community Association Cold Lake Continuous Monitoring Station						MAXIMUM VALUES							OPERATIONAL TIME (%)
PARAMETER	OBJECTIVES		EXCEEDANCES		MONTHLY AVERAGE	1-HOUR					24-HOUR		
	1-hr	24-hr	1-hr	24-hr		READING	DAY	HOUR	WIND SPEED (kph)	WIND DIRECTION (sector)	READING	DAY	
SO ₂ (ppb)	172	48	0	0	0	2	13	4	7.7	NW	1	13	100.0
TRS (ppb)	-	-	-	-	0	0	1	0	6.1	WNW	0	1	100.0
THC (ppm)	-	-	-	-	2.10	2.94	10	7	0.6	ESE	2.56	6	99.1
NO ₂ (ppb)	159	-	0	-	3	15	19	17	1.8	ENE	6	22	100.0
NO (ppb)	-	-	-	-	1	58	10	10	0.9	W	7	10	100.0
NO _x (ppb)	-	-	-	-	3	72	10	8	0.9	W	12	10	100.0
O ₃ (ppb)	82	-	0	-	21.0	40.0	5	14	11.4	SW	32.2	29	99.2
PM _{2.5} (µg/m ³)	80	30	0	0	2	21	30	22	0.3	S	8	20	100.0
RELATIVE HUMIDITY (%)	-	-	-	-	70	96	25	8	10.6	ENE	91	31	100.0
AMBIENT TEMPERATURE (°C)	-	-	-	-	3.9	19.2	5	15	11.5	SW	10.2	5	100.0
VECTOR WS (kph)	-	-	-	-	3.6	24.4	18	0	-	WNW	15.4	2	100.0
VECTOR WD (sec)	-	-	-	-	302 (WNW)	-	-	-	-	-	-	-	100.0

Exceedance Summary Report

SO₂ 1-Hour Exceedances

Measured concentrations of sulphur dioxide were below the 1-hour AAAQO of 172 ppb.

SO₂ 24-Hour Exceedances

Measured concentrations of sulphur dioxide were below the 24-hour AAAQO of 48.0 ppb.

NO₂ 1-Hour Exceedances

Measured concentrations of nitrogen dioxide were below the 1-hour AAAQO of 159 ppb.

PM_{2.5} 1-Hour Exceedances

Measured concentrations of fine particulate matter were below the 1-hour AAAQO of 80 µg/m³.

PM_{2.5} 24-Hour Exceedances

Measured concentrations of fine particulate matter were below the 24-hour AAAQO of 30 µg/m³.

O₃ 1-Hour Exceedances

Measured concentrations of ozone were below the 1-hour AAAQO of 82 ppb.

In accordance with EPEA and the Substance Release Regulation.

In accordance with A Guide to Release Reporting and the Alberta Ambient Air Quality Objectives and Guidelines Summary.

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1.0 Discussion

This monthly report consists of continuous monitoring results for the following parameters: Sulphur Dioxide (SO₂), Total Reduced Sulphur (TRS), Total Hydrocarbon (THC), Oxides of Nitrogen (NO_x), Nitric Oxides (NO), Nitrogen Dioxide (NO₂), Ozone (O₃), Particulate Matter 2.5 (PM_{2.5}), Relative Humidity (RH), Ambient Temperature (AmbTPX), Wind Speed (WS), Wind Direction (WD) and Standard Deviation Wind Direction (STDWD).

The sample inlet filter for all continuous air analyzers are replaced before the calibration begins. The sample manifold is cleaned during the site visit each month.

Control checks, consisting of a zero and span, are conducted daily on all continuous air monitors. In place of the air sample, zero air (from scrubbed air or gas cylinders) is used for zero checks, and a known concentration of the pollutant being analyzed is used for span checks. These checks are controlled by automatic timers and valves. The total zero span cycle is completed within an hour, the commencement of the zero span cycle is at the beginning of the hour.

Multipoint calibrations are done a minimum of once a month for each continuous air monitor. An additional calibration is required under the following conditions: 1) within three days after the initial start-up and stabilization of a newly installed instrument, 2) prior to shut-down or moving of an instrument which has been working to specification, and 3) when major repair has been done on the instrument.

Time during the first multi-point calibration is not considered downtime (Data is flagged as C). If more than one calibration is performed during the month, the time during the additional calibration is considered as downtime (Data is flagged as C1).

Only one zero/span check is run per day. Time during the zero/span check is not considered as downtime (Data is flagged as S). If an extra zero/span check is performed, the time during the additional check is considered as downtime (Data is flagged as S1).

The AMD requires each instrument and accompanying data recording system to be operational 90% of the time, at a minimum, for each monthly monitoring period.

All sampling, analysis, and QA/QC for this project was performed by Maxxam Analytics and complies with the Alberta Air Monitoring Directive.

Data contained in this monthly report has undergone the verification and validation based on the requirements of the AMD Chapter 6: Ambient Data Quality (December, 2016). The descriptions of the data verification and validation process can be found in Section 5 of this report. Instantaneous data, where applicable, is provided for reference purposes and has not undergone zero correction. The minimum and maximum statistics are highlighted in the data table and are for reference only. The highlighted cells are based on the software's interpretation of the exact position of the minimum or maximum value. The visual presentation of these statistics may not be the obvious choice in a data range due to rounding, truncating or analyzer specifications.

Hourly/minute data have been reviewed based on daily zero/span results and multi-point calibration results. Data may be considered invalid if a zero-corrected span check in excess of +/- 10% of the span concentration (established by the previous multi-point calibration) is encountered and/or significant differences in the calibration factor occurs (greater than 10%).

SULPHUR DIOXIDE (SO₂)

- Operational time, for the monitoring period, was 100%.
- The routine monthly calibration was performed on October 10.

TOTAL REDUCED SULPHUR (TRS)

- Operational time, for the monitoring period, was 100%.
- The routine monthly calibration was performed on October 10.

TOTAL HYDROCARBONS (THC)

- Operational time, for the monitoring period, was 99.1%, equivalent to seven hours of downtime.
- The routine monthly calibration was performed on October 11.
- Towards the end of the month, specifically after October 22, instability in zero response was observed. Additional zero-span checks were performed on October 26 at hour 09:00 and October 28 at hour 17:00 in response to abrupt zero drifts. This prompted a site visit on October 30 where a successful repeat calibration was completed. As the repeat calibration met AMD requirements, no data was invalidated due to this event. Seven hours of downtime were, however, recorded due to the additional quality checks.
- The calibrator zero obtained from the repeat calibration was applied for baseline correction on data collected from October 22 at hour 22:00 to October 30 at hour 09:00. Although the daily zero check results met the AMD requirements, they did show some instability. Calibrator zero was therefore applied for baseline correction on data. It was observed that the zero drifts correlated with shifts in Barometric Pressure recorded in the Cold Lake area at that time. However, the causal factors for this observation could not be determined and as such this is not a definitive conclusion.
- Data recorded on October 17 exhibited a generally low trend. Corresponding minute data was reviewed and analyzer performance at that period was verified. It was also observed that there was an increase in wind speed and a significant shift in wind direction during this period. There is no reason to consider the data invalid.
- The span gas cylinder was replaced on October 26. Expected span value was subsequently updated to reflect the new gas concentration, following a repeat span check.
- Low concentrations were recorded on October 28. However, as the analyzer passed the zero/span check, data is considered valid.
- The observed trends were consistent across the LICA network. Arrangements are being made to replace the analyzers for further off-site troubleshooting and maintenance.

OXIDES OF NITROGEN (NO_x), NITRIC OXIDE (NO) and NITROGEN DIOXIDE (NO₂)

- Operational time, for the monitoring period, was 100%.
- The routine monthly calibration was performed on October 10.

OZONE (O₃)

- Operational time, for the monitoring period, was 99.2%, equivalent to six hours of downtime.
- The routine monthly calibration was performed on October 11.
- The analyzer did not span correctly on October 24. Additional zero-span checks conducted between October 25 and October 26 revealed that the pump of the zero-span system had failed. The pump was repaired on October 26 and a successful zero-span check was completed afterwards. As this event was limited to the zero-span system, no data was discarded. Six hours of downtime were, however, recorded due to additional quality checks.

PARTICULATE MATTER < 2.5 MICRONS (PM_{2.5})

- Operational time, for the monitoring period, was 100%.
- The routine monthly audit was performed on October 11.
- Data was corrected in accordance with AMD (2016), Chapter 6, Table 2, Zero Adjustment Criteria. Data recorded between 0 and -3 µg/m³ was corrected to 0 µg/m³. Data recorded below -3 µg/m³ was invalidated. No hourly data was invalidated as all measurements were above -3 µg/m³ this month.

WIND SPEED (WS), WIND DIRECTION (WD) and STANDARD DEVIATION WIND DIRECTION (STDWD)

- Operational time, for the monitoring period was 100%.
- The Met One (s/n: F1644) wind system was removed on October 23 as it was due for a bi-annual factory calibration. An RM Young model (s/n: 92411) was installed as a replacement, following an installation calibration.
- Wind data is reported as vector wind speed and vector wind direction. Wind direction is defined as the direction from which the wind is blowing from and is measured in degrees from true north.

RELATIVE HUMIDITY (RH)

- Operational time, for the monitoring period, was 100%.

BAROMETRIC PRESSURE (BP)

- Operational time, for the monitoring period, was 100%.

AMBIENT TEMPERATURE (AmbTPX)

- Operational time, for the monitoring period, was 100%.

2.0 Project Personnel

Mike Bisaga was the contact for Lakeland Industry & Community Association and the Maxxam field technician was Alexander Yakupov.

3.0 Plant Monthly Required AMD Summary

All data collected this month was compliant with the requirements outlined in the Air Monitoring Directive (Alberta Environment and Parks, 2016).

The operational time for all continuous ambient air analyzers, meteorological systems and data acquisition systems were above the 90% requirement.

4.0 Calculations and Results

All calculations and reporting of results follow the methods described in the AMD, 2016.

5.0 Methods and Procedures

The following methods and procedures were used to complete the monitoring program:

- Maxxam AIR SOP-00208: RM Young Wind Monitor Calibration
- Met One Instruments: Operation Manual Document No. 50.5-9800
- Maxxam AIR SOP-00209: Ambient Sulphur Monitoring
- Maxxam AIR SOP-00212: Ambient O₃ Monitoring
- Maxxam AIR SOP-00213: Ambient NO/NO₂/NO_x Monitoring
- Maxxam AIR SOP-00214: Ambient Hydrocarbon (THC) Monitoring
- Maxxam AIR SOP-00010: Thermo Model 5030 SHARP Monitor

There were no deviations from the prescribed methods.

The following instruments were used to perform the test program:

- Sulphur Dioxide - Thermo 43i UV Fluorescent Analyzer
- Total Reduced Sulphur - Thermo 450i UV Fluorescent Analyzer
- Total Hydrocarbons - Thermo 51C FID Analyzer
- Oxides of Nitrogen - Thermo 42i Chemiluminescent Analyzer
- Ozone - Thermo 49i Photometric Analyzer
- Particulate Matter (PM_{2.5}) - Thermo 5030 SHARP Unit
- Wind System - RM Young Unit and Met One Unit
- Relative Humidity - Met One Unit
- Barometric Pressure - Met One Unit
- Ambient Temperature - Met One Unit
- Datalogger - ESC 8832

The following steps were used to complete the data verification and validation process:

Level 0 Preliminary Verification

Level 0 data are raw data obtained directly from the data acquisition system (DAS). Under the step of Level 0, these data undergo a certain amount of manual or automated screening and flagging. It included a) identification of periods of missing data; b) verification of time stamps against reference time; c) verification that instrument diagnostics/datalogger flags indicate normal operation; d) comparison of data to upper and lower limits; e) rate of change flagging indicating that data changed too rapidly or not at all; and f) verification that zero, span and multipoint performance checks are within specifications. This level of verification is performed on a daily basis.

Level 1 Primary Validation

Validation actions under the step of Level 1 include a) review of all screening flags assigned during preliminary verification; b) review of all supporting site information and documentation; c) review of operational acceptance limits for each parameter/analyzer; d) review of daily zero/span and monthly calibration results for all gaseous parameters; and e) application of any necessary adjustments to data (e.g. baseline adjustments, below zero adjustments). This level of validation is performed on a monthly basis.

Level 2 Final Validation

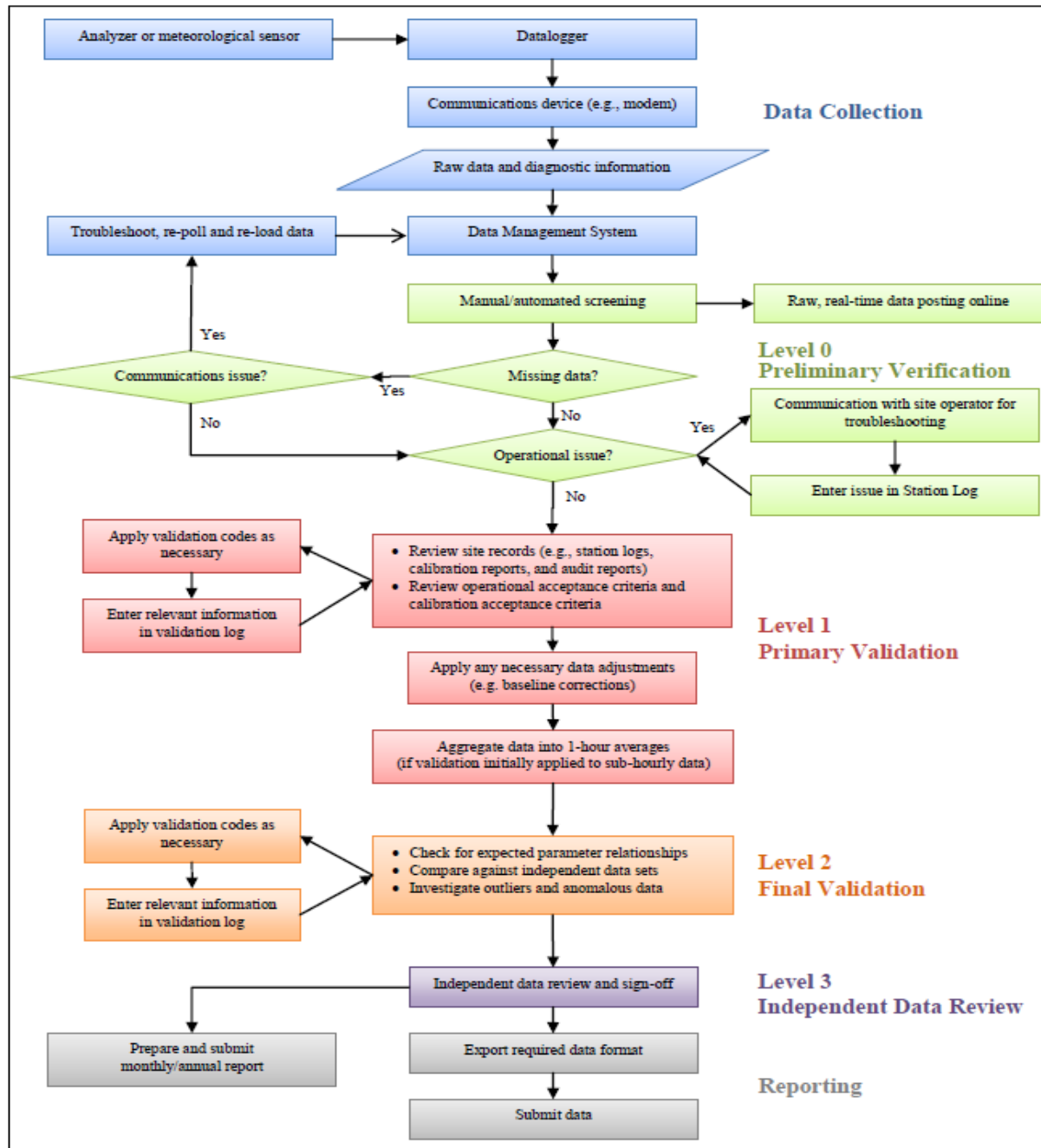
The purpose of Level 2 validation is to verify that there are no inconsistencies among related data, or among regional data measured at nearby sites.

Level 3 Independent Data Review

Level 3 validation is the last step of data review, and it is completed by an individual that is independent of both field operations and primary data validation. A final independent QA review and endorsement is performed during this step before data is submitted to Alberta Environment.

Post-Final Validation

The Post-Final Validation step serves to re-evaluate the data that errors or omissions are discovered and/or suspected after the initial submittal of data. Any data issues or patterns which were not clear on a monthly basis are highlighted during this step. This validation is performed on an annual basis.



Source: Air Monitoring Directive (December 2016), Chapter 6, Ambient Data Quality; Figure 1 Data Collection and Management Process Flow Chart

APPENDIX I
CONTINUOUS MONITORING DATA RESULTS

SULPHUR DIOXIDE

SULPHUR DIOXIDE Hourly Averages (SO₂ ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.	
DAY																												
1	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	1	0	24
2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	24
3	0	0	0	0	1	1	1	1	1	1	1	0	0	0	0	0	S	0	0	0	0	0	0	0	0	1	0	24
4	0	0	0	0	0	0	0	0	1	1	1	1	1	1	0	S	0	0	0	0	0	0	0	0	0	1	0	24
5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	1	0	24
6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	24
7	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	24
8	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
9	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
10	0	0	0	0	0	0	0	0	0	0	C	C	C	C	C	0	0	0	0	0	0	0	0	0	0	0	0	24
11	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
12	0	0	0	0	0	0	0	0	S	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	1	0	24
13	1	1	1	1	2	2	2	S	1	1	0	0	1	1	1	1	1	0	0	0	0	0	0	0	0	2	1	24
14	0	0	0	0	0	0	S	0	0	0	0	0	1	1	1	1	0	0	0	0	0	0	0	0	0	1	0	24
15	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
16	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
17	0	0	0	S	0	0	0	0	0	0	0	0	1	1	1	1	1	0	0	0	0	0	0	0	0	1	0	24
18	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
19	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
20	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	0	1	0	S	0	1	0	24
21	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	1	0	24
22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	24
23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	24
24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	24
25	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	1	0	24
26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	24
27	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0	S	0	0	0	0	0	0	0	0	0	1	0	24
28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	24
29	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	24
30	0	0	0	1	1	0	0	0	0	0	0	1	1	S	1	1	0	0	0	0	0	0	0	0	0	1	0	24
31	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
HOURLY MAX	1	1	1	1	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	0	1	0	0	0				
HOURLY AVG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				

STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

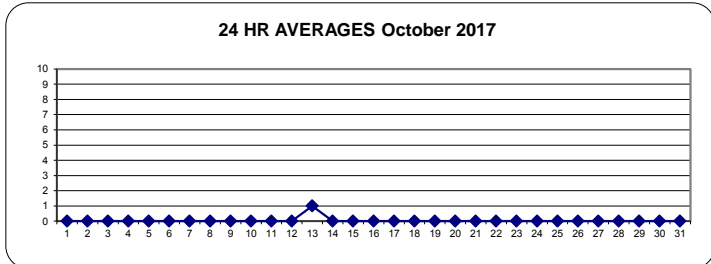
OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT:	1-HR	172	ppb	24-HR	48	ppb
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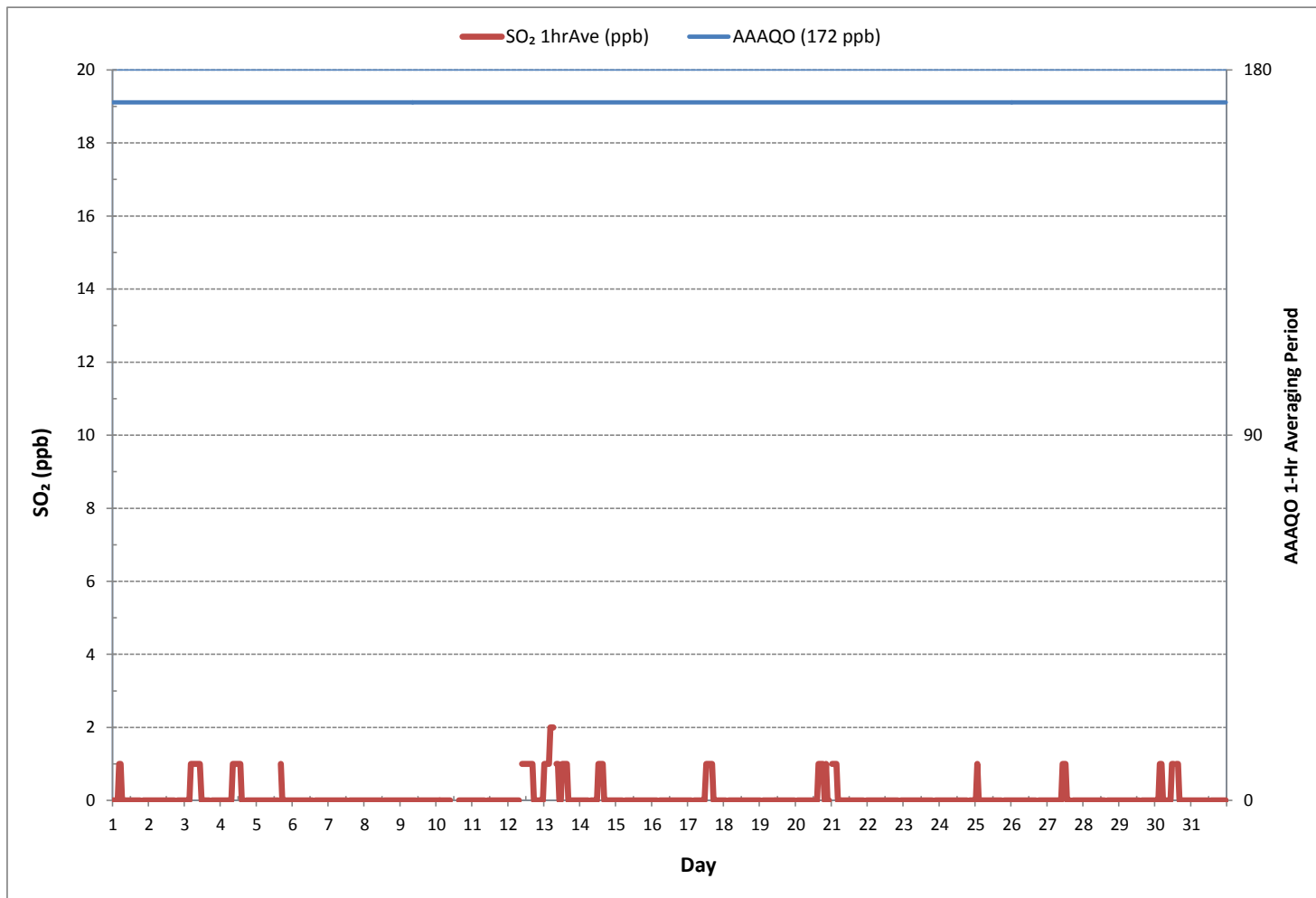
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0		
NUMBER OF 24-HR EXCEEDANCES:	0		
NUMBER OF NON-ZERO READINGS:	65		
MINIMUM 1-HR AVERAGE:	0 ppb @ HOUR ON DAY 1		
MAXIMUM 1-HR AVERAGE:	2 ppb @ HOUR ON DAY 13		
MAXIMUM 24-HR AVERAGE:	1 ppb ON DAY 13		
IZS CALIBRATION TIME:	31 hrs	OPERATIONAL TIME:	744 hrs
MONTHLY CALIBRATION TIME:	5 hrs	AMD OPERATION UPTIME:	100.0 %
STANDARD DEVIATION:	0	MONTHLY AVERAGE:	0 ppb

24 HR AVERAGES October 2017



SULPHUR DIOXIDE Hourly Averages (SO₂ ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Cold Lake Continuous Monitoring Station - October 2017

SULPHUR DIOXIDE Instantaneous Maximum (SO₂ ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY 1	0	0	0	1	1	1	1	1	1	1	0	1	1	0	0	1	1	0	0	S	0	0	0	0	0	0	1	0	24
2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	24
3	0	0	0	1	1	1	1	1	2	2	1	1	0	0	0	0	0	0	S	0	0	0	0	0	0	0	2	0	24
4	1	1	1	0	1	0	0	0	1	1	1	2	1	1	1	1	S	1	0	0	0	0	0	0	0	0	2	1	24
5	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	S	1	1	1	0	1	0	1	0	0	1	0	24	
6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	24
7	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	1	0	0	0	0	0	0	0	1	0	1	0	24
8	1	1	1	1	1	1	0	1	0	1	0	0	S	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	24
9	0	0	0	0	0	1	0	0	0	0	0	S	0	1	1	0	0	0	0	0	0	0	0	0	0	0	1	0	24
10	0	0	0	0	0	0	1	0	1	0	C	C	C	C	C	0	1	0	1	0	0	0	0	0	0	0	1	0	24
11	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
12	0	0	0	0	1	1	0	1	S	1	1	1	1	1	2	1	1	1	1	0	1	0	0	1	1	0	2	1	24
13	1	1	1	2	2	2	2	S	2	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	2	1	24
14	0	0	0	0	0	0	S	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	1	0	24
15	0	1	0	0	0	S	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24
16	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
17	0	0	0	S	0	0	0	0	0	0	0	1	1	1	2	1	1	1	1	0	0	0	0	0	0	0	2	0	24
18	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
19	0	S	0	0	0	0	0	0	0	0	1	1	1	1	0	1	1	1	0	1	0	0	1	0	0	0	1	0	24
20	S	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	0	S	0	1	0	24	
21	1	1	1	1	1	1	0	0	0	1	1	0	1	0	0	0	0	0	0	0	0	0	0	S	0	0	1	0	24
22	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	1	0	0	0	0	S	0	0	0	1	0	24
23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	24
24	0	0	1	0	0	0	0	1	1	0	0	0	0	1	0	0	0	0	1	S	0	0	0	0	1	0	1	0	24
25	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	1	0	24
26	0	0	0	1	0	0	1	1	0	1	0	0	0	0	0	0	0	S	1	0	0	0	0	0	0	0	1	0	24
27	0	0	0	0	0	0	0	0	0	0	2	2	2	1	0	0	S	0	0	0	0	0	0	0	0	0	2	0	24
28	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	S	0	0	0	1	0	1	0	1	0	1	0	24	
29	0	1	0	1	1	1	1	1	1	1	0	1	0	S	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24
30	1	1	1	1	1	1	0	0	0	0	1	1	S	1	1	1	1	0	0	0	0	0	0	0	0	0	1	1	24
31	0	0	0	0	0	0	0	0	0	0	0	0	S	1	0	1	1	0	0	0	0	0	0	0	0	0	1	0	24
HOURLY MAX	1	1	1	2	2	2	2	1	2	2	2	2	2	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	24
HOURLY AVG	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24

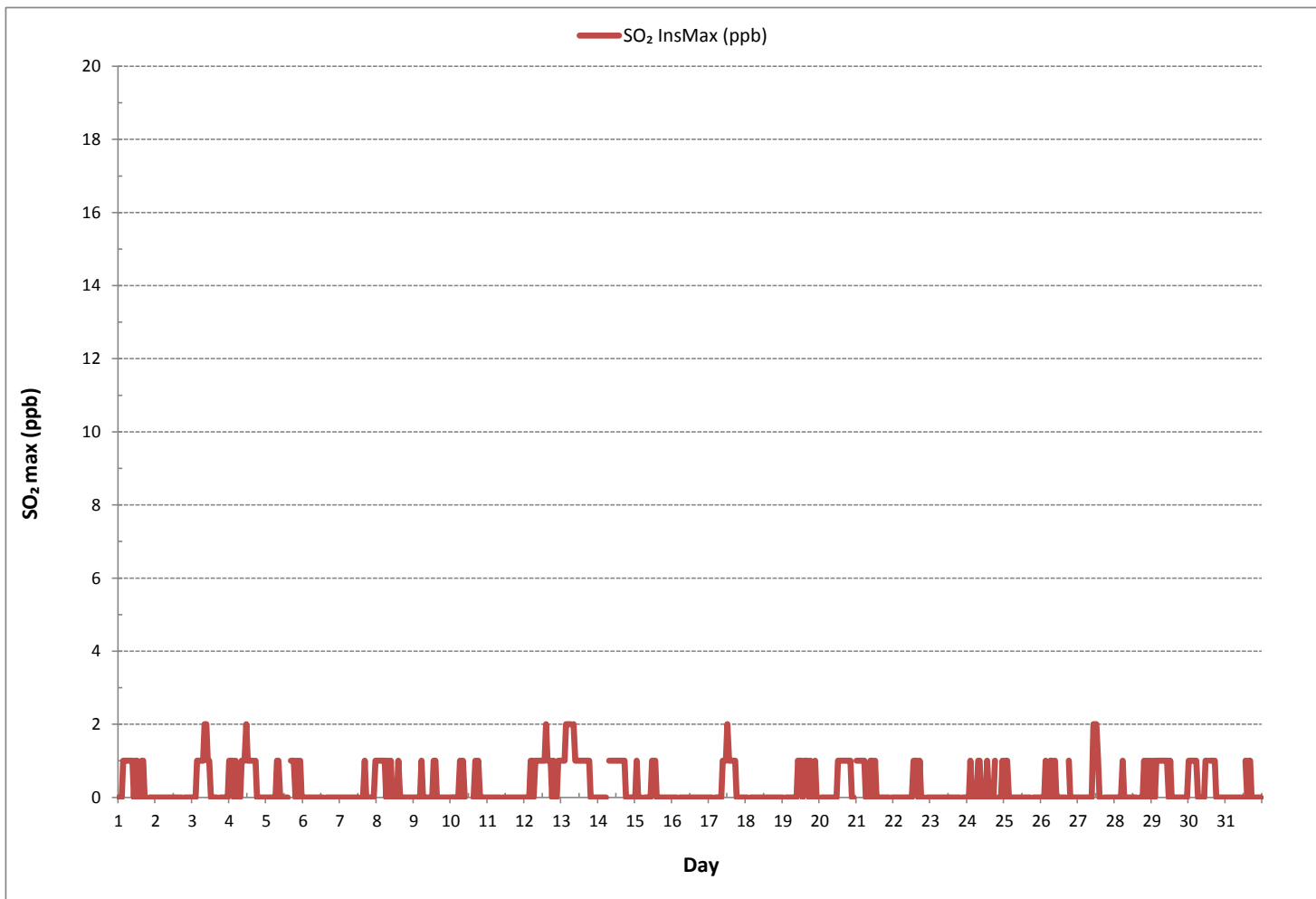
STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	191
MAXIMUM INSTANTANEOUS VALUE:	2 ppb @ HOUR 8 ON DAY 3
IZS CALIBRATION TIME:	31 hrs
MONTHLY CALIBRATION TIME:	5 hrs
STANDARD DEVIATION:	0
OPERATIONAL TIME:	744 hrs

SULPHUR DIOXIDE Instantaneous Maximum (SO₂ ppb)



Wind: LICA COLD LAKE SOUTH
 Poll.: LICA COLD LAKE SOUTH-SO₂[ppb]
 Monthly: 17/10
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

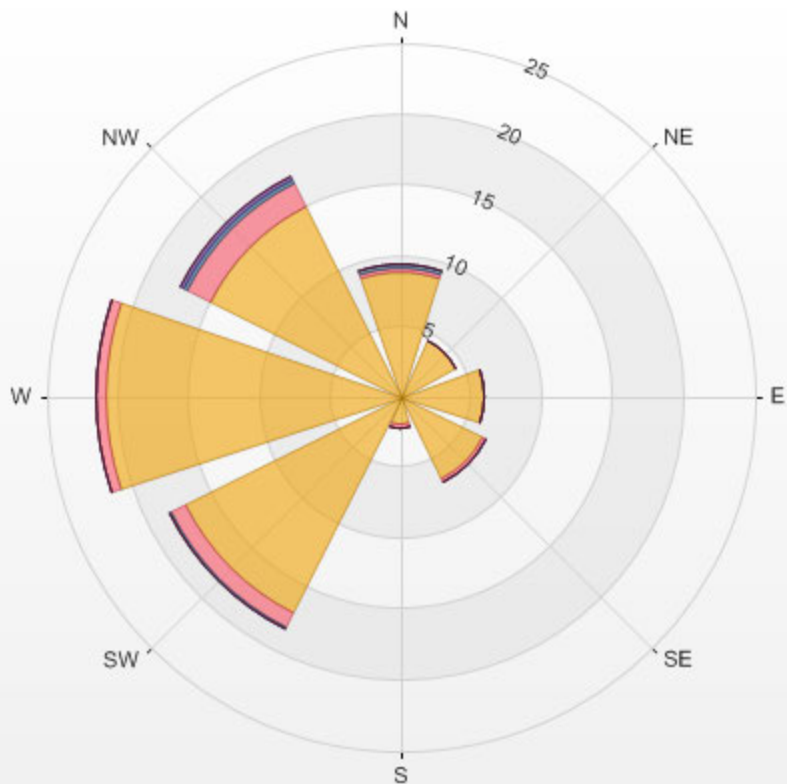
Calm: 13.80%

Calm Avg: 0.08 [ppb]

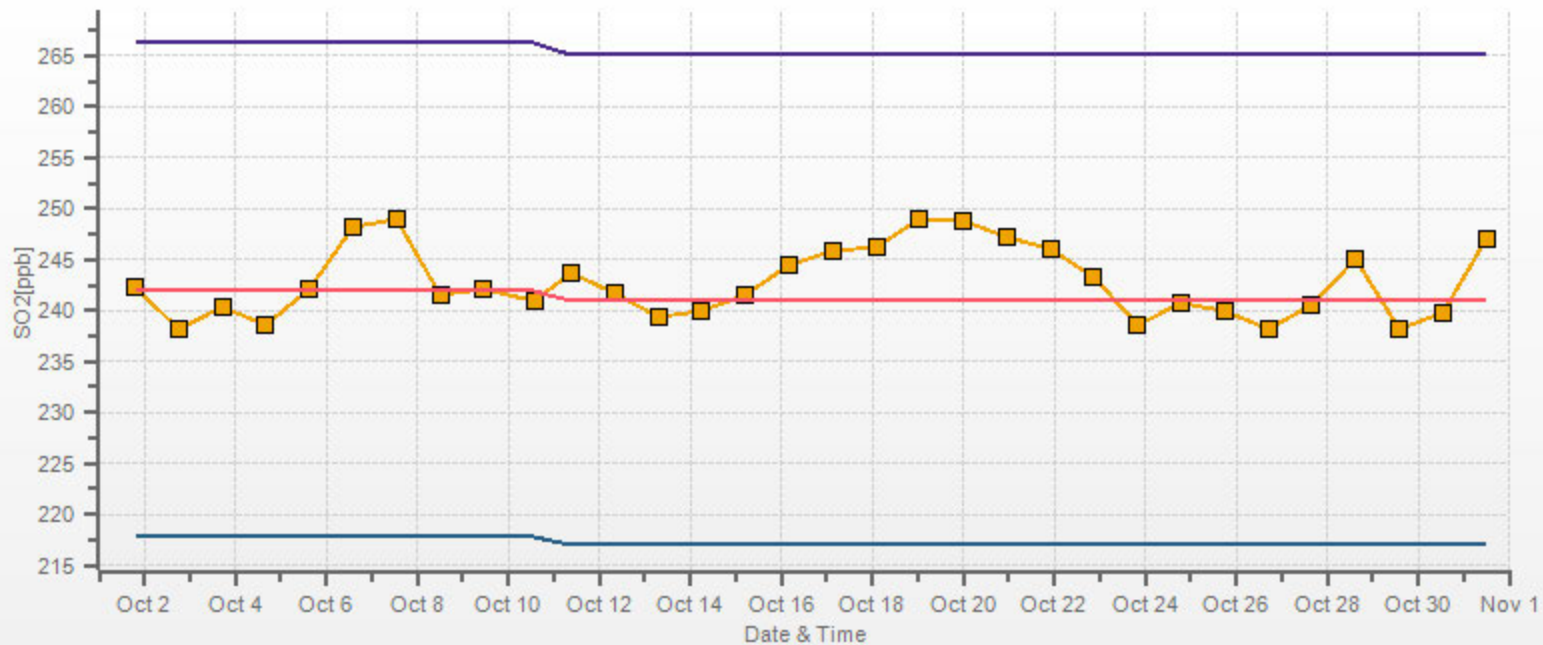
Direction	0.0-0.6	0.6-1.2	1.2-1.8	1.8-2.4	2.4-3.0	>3.0	Total
N	8.8	0.3	0.3	0.0	0.0	0.0	9.4
NE	4.4	0.0	0.0	0.0	0.0	0.0	4.4
E	6.0	0.0	0.0	0.0	0.0	0.0	6.0
SE	6.5	0.3	0.0	0.0	0.0	0.0	6.8
S	2.0	0.3	0.0	0.0	0.0	0.0	2.3
SW	17.1	1.1	0.1	0.0	0.0	0.0	18.4
W	20.8	0.7	0.0	0.0	0.0	0.0	21.5
NW	15.1	1.9	0.3	0.3	0.0	0.0	17.5
Summary	80.7	4.5	0.7	0.3	0.0	0.0	86.2

% Icon	Classes (ppb)	81	5	1	0	0	0
	0.0-0.6						
	0.6-1.2						
	1.2-1.8						
	1.8-2.4						
	2.4-3.0						
	>3.0						

LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-SO2[ppb] 2017/10/01 00:00 - 2017/10/31 23:00 Calm: 13.80% Calm Poll Avg: 0.08[ppb]



SO2[ppb] Calibration: LICA COLD LAKE SOUTH Monthly: 17/10 Type: Span



Span Meas Span Ref Span Low Span High

TOTAL REDUCED SULPHUR

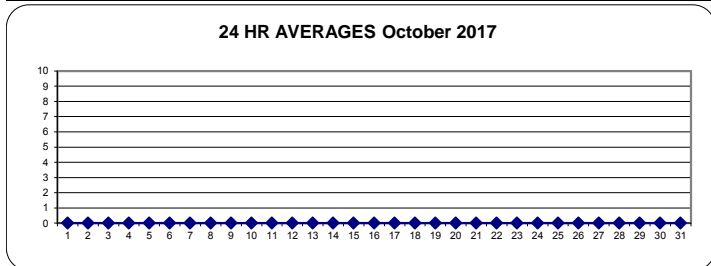
TOTAL REDUCED SULPHUR Hourly Averages (TRS ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY MIN.	DAILY MAX.	24-HR AVG.	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59				
DAY 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	24
DAY 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	24
DAY 3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	24	
DAY 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	24	
DAY 5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	24	
DAY 6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	24	
DAY 7	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	24	
DAY 8	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24	
DAY 9	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24	
DAY 10	0	0	0	0	0	0	0	0	0	0	C	C	C	C	C	0	0	0	0	0	0	0	0	0	0	0	24	
DAY 11	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24	
DAY 12	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24	
DAY 13	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24	
DAY 14	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24	
DAY 15	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24	
DAY 16	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24	
DAY 17	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24	
DAY 18	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24	
DAY 19	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24	
DAY 20	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	24	
DAY 21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	24	
DAY 22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	24	
DAY 23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	24	
DAY 24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	24	
DAY 25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	24	
DAY 26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	24	
DAY 27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	24	
DAY 28	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	24	
DAY 29	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	24	
DAY 30	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24	
DAY 31	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24	
HOURLY MAX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
HOURLY AVG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					

STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

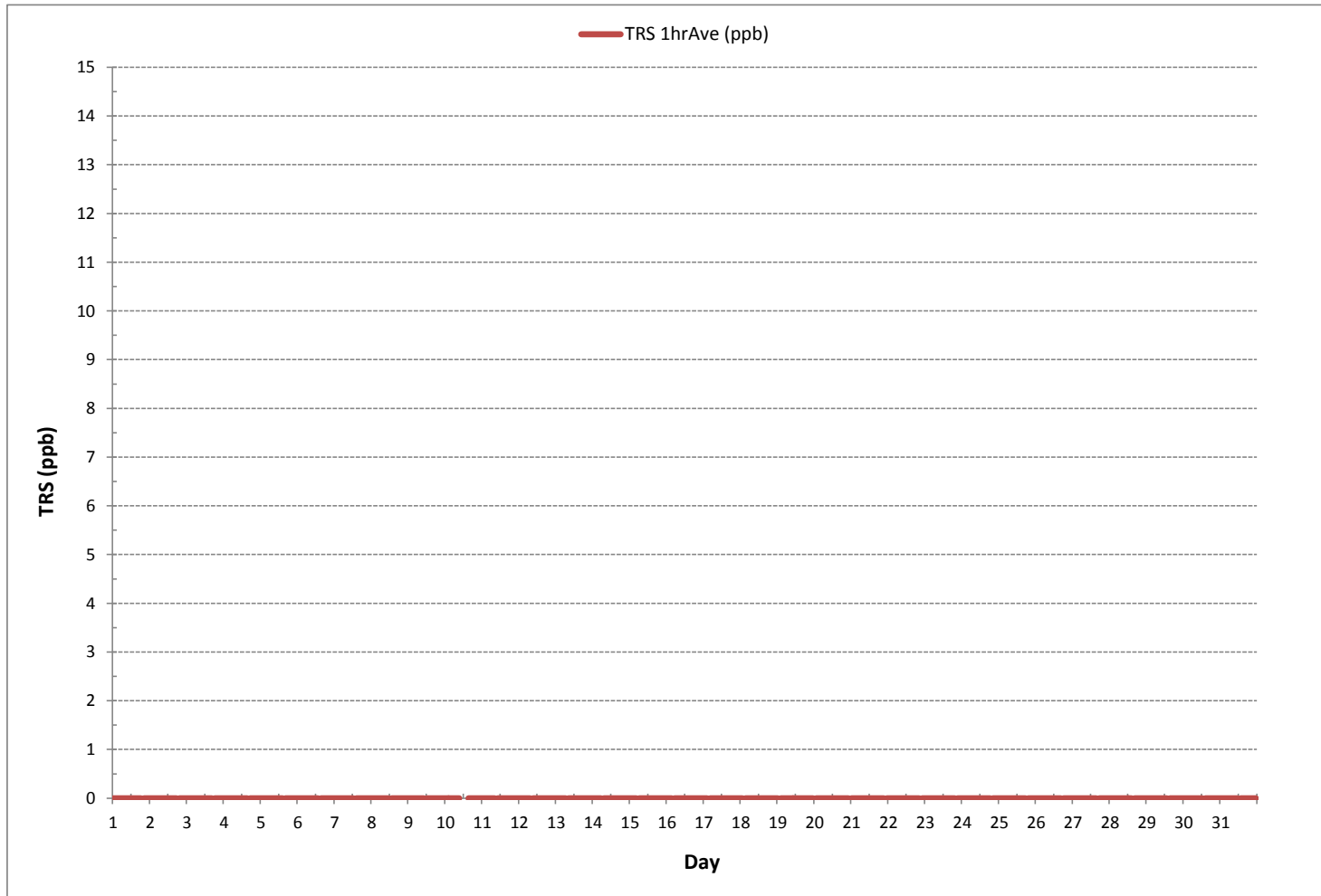
24 HR AVERAGES October 2017



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	0			
MINIMUM 1-HR AVERAGE:	0	ppb @ HOUR	0	ON DAY 1
MAXIMUM 1-HR AVERAGE:	0	ppb @ HOUR	0	ON DAY 1
MAXIMUM 24-HR AVERAGE:	0	ppb		ON DAY 1
IZS CALIBRATION TIME:	31	hrs	OPERATIONAL TIME:	744 hrs
MONTHLY CALIBRATION TIME:	5	hrs	AMD OPERATION UPTIME:	100.0 %
STANDARD DEVIATION:	0		MONTHLY AVERAGE:	0 ppb

TOTAL REDUCED SULPHUR Hourly Averages (TRS ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Cold Lake Continuous Monitoring Station - October 2017

TOTAL REDUCED SULPHUR Instantaneous Maximum (TRS ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY																													
1	1	1	0	0	1	0	1	1	1	1	1	1	0	1	1	1	1	1	1	1	S	1	1	1	1	0	1	1	24
2	1	1	1	1	1	1	1	1	1	0	0	0	0	0	1	1	0	0	S	0	1	0	1	0	0	0	1	1	24
3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	S	1	1	1	1	1	1	1	1	1	24
4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	S	1	1	1	1	1	0	1	1	0	1	1	24
5	1	1	1	0	1	1	1	1	0	1	1	0	0	1	1	S	0	0	0	1	1	0	0	1	0	1	0	1	24
6	0	1	1	1	1	0	1	1	1	1	1	1	1	0	S	1	1	1	1	1	0	1	1	1	1	0	1	1	24
7	1	1	1	1	1	1	1	0	1	0	1	1	0	S	1	0	0	1	0	1	0	1	0	1	1	0	0	1	24
8	1	1	1	1	0	1	1	1	1	1	1	1	S	1	1	1	1	0	1	0	1	1	0	1	0	1	0	1	24
9	1	1	0	1	1	0	0	1	1	1	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	24
10	0	1	0	0	1	1	1	1	1	1	C	C	C	C	C	1	1	1	1	1	1	1	1	1	0	0	1	1	24
11	0	1	1	1	1	1	1	1	0	S	0	1	1	1	1	1	1	1	1	1	0	0	0	1	0	0	1	1	24
12	0	1	0	1	1	1	1	1	0	S	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	0	1	1	24
13	1	1	0	1	1	1	1	S	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	0	1	1	24
14	1	0	0	0	0	S	1	1	1	1	1	0	1	1	1	1	0	1	1	1	1	1	1	1	1	0	1	1	24
15	1	1	1	1	1	S	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	0	1	1	24
16	1	1	1	0	S	1	1	1	1	1	1	1	0	1	0	1	1	1	1	1	1	1	1	1	1	0	1	1	24
17	1	1	1	S	0	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	24
18	1	1	S	1	1	1	0	0	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	24
19	0	S	1	0	1	0	0	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	0	1	1	24
20	S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	1	0	1	0	1	S	0	1	1	24
21	1	1	1	1	1	0	1	1	1	1	1	1	0	1	1	1	0	0	0	1	1	1	1	S	1	0	1	1	24
22	1	1	1	1	0	1	1	1	0	1	1	1	0	0	1	1	1	1	1	1	1	1	S	1	1	0	1	1	24
23	1	1	1	1	1	1	1	1	1	1	1	0	0	0	1	0	1	0	1	1	1	S	1	0	1	0	1	1	24
24	1	1	1	1	1	1	1	1	1	1	0	1	0	0	1	1	1	1	1	1	S	1	0	1	1	0	1	1	24
25	1	1	1	1	1	1	0	1	0	1	1	1	0	1	1	1	1	1	S	0	1	1	1	1	1	0	1	1	24
26	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	S	1	1	1	1	1	1	1	1	1	1	24
27	1	1	1	1	0	1	1	1	1	1	1	1	1	0	0	S	1	0	0	1	1	1	1	1	1	0	1	1	24
28	1	1	1	0	1	1	0	1	0	0	1	1	0	1	1	S	1	1	1	1	1	1	0	1	1	0	1	1	24
29	1	1	1	1	1	1	1	1	1	1	1	1	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	24
30	1	1	1	1	1	1	1	1	1	0	1	1	0	S	1	1	1	1	1	1	1	0	1	1	1	0	1	1	24
31	0	1	1	1	1	1	1	1	1	1	1	1	S	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	24
HOURLY MAX	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	24
HOURLY AVG	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	24

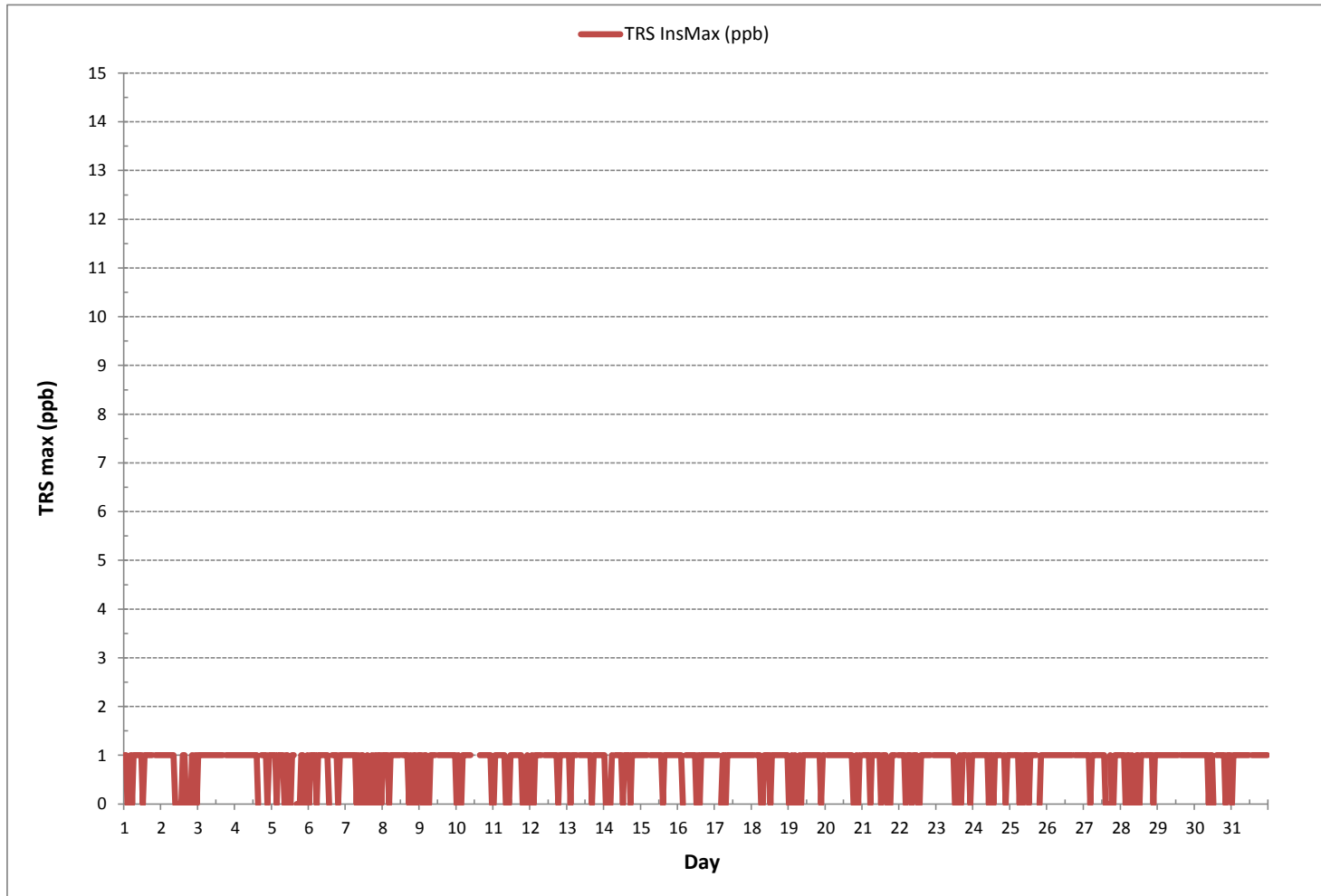
STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	588
MAXIMUM INSTANTANEOUS VALUE:	1 ppb @ HOUR 0 ON DAY 1
IZS CALIBRATION TIME:	31 hrs
MONTHLY CALIBRATION TIME:	5 hrs
STANDARD DEVIATION:	0
OPERATIONAL TIME:	744 hrs

TOTAL REDUCED SULPHUR Instantaneous Maximum (TRS ppb)



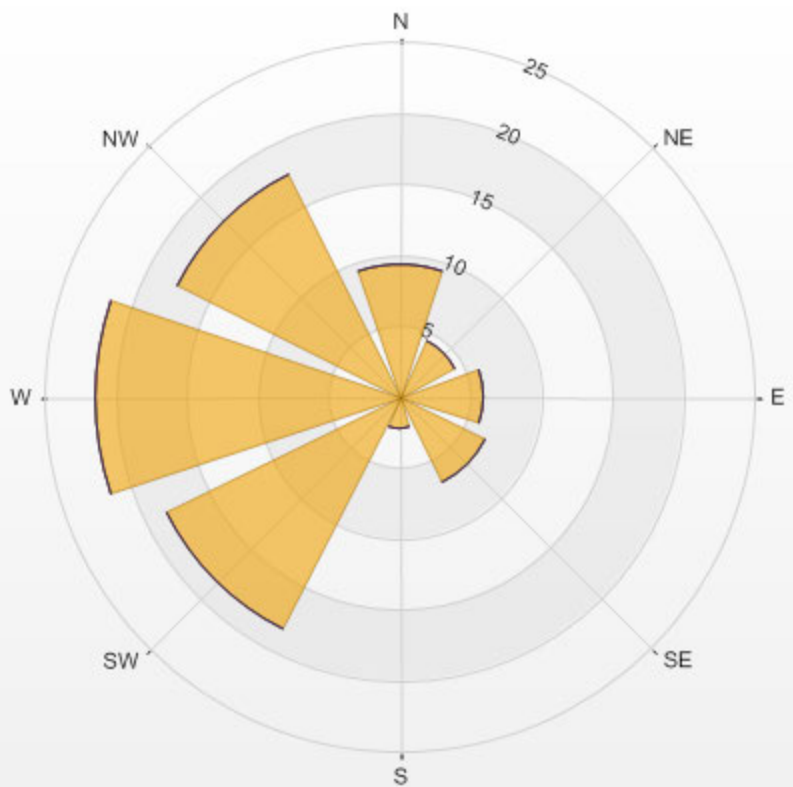
Wind: LICA COLD LAKE SOUTH
 Poll.: LICA COLD LAKE SOUTH-TRS[ppb]
 Monthly: 17/10
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 13.80% Calm Avg: 0.19 [ppb]

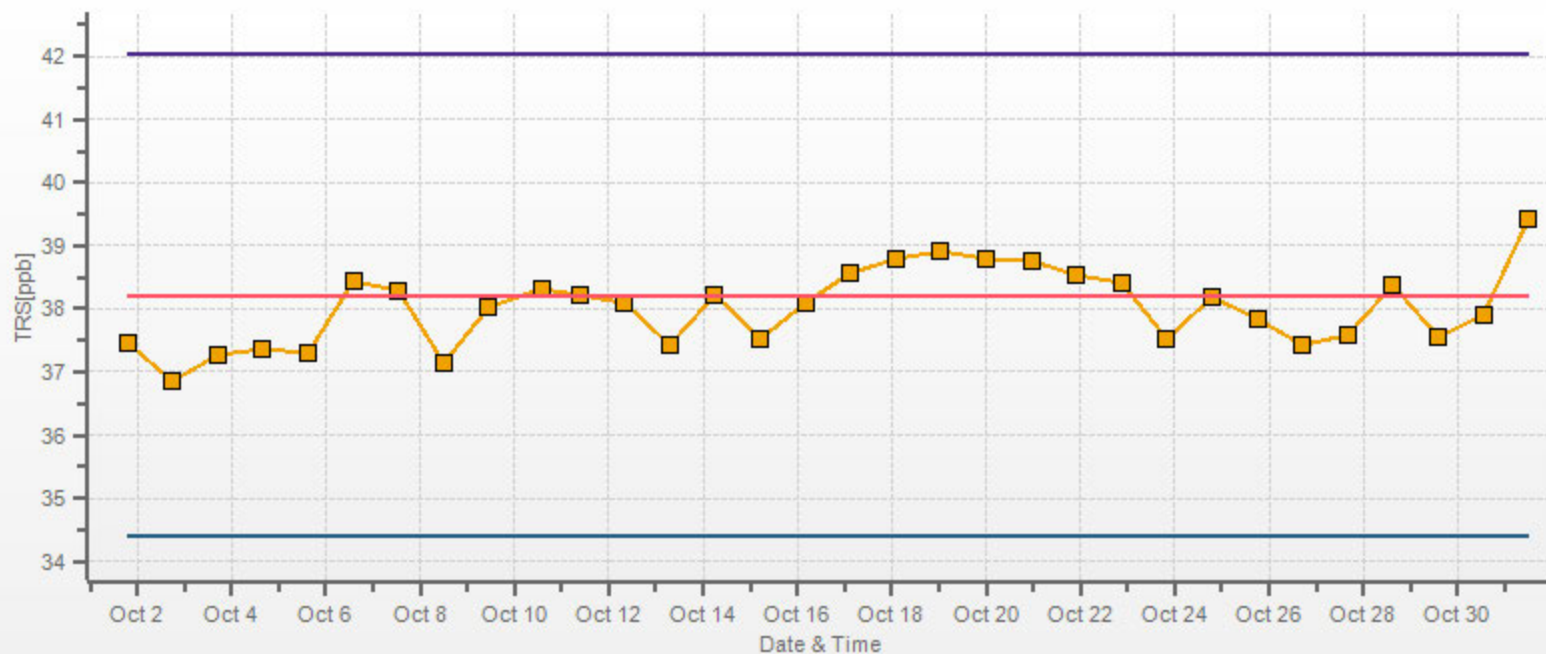
Direction	0.0-0.6	0.6-1.3	1.3-1.9	>1.9	Total
N	9.4	0.0	0.0	0.0	9.4
NE	4.4	0.0	0.0	0.0	4.4
E	6.0	0.0	0.0	0.0	6.0
SE	6.8	0.0	0.0	0.0	6.8
S	2.3	0.0	0.0	0.0	2.3
SW	18.4	0.0	0.0	0.0	18.4
W	21.5	0.0	0.0	0.0	21.5
NW	17.5	0.0	0.0	0.0	17.5
Summary	86.2	0.0	0.0	0.0	86.2

% Icon Classes (ppb) 86 0.0-0.6 0 0.6-1.3 0 1.3-1.9 0 >1.9

LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-TRS[ppb] 2017/10/01 00:00 - 2017/10/31 23:00 Calm: 13.80% Calm Poll Avg: 0.19[ppb]



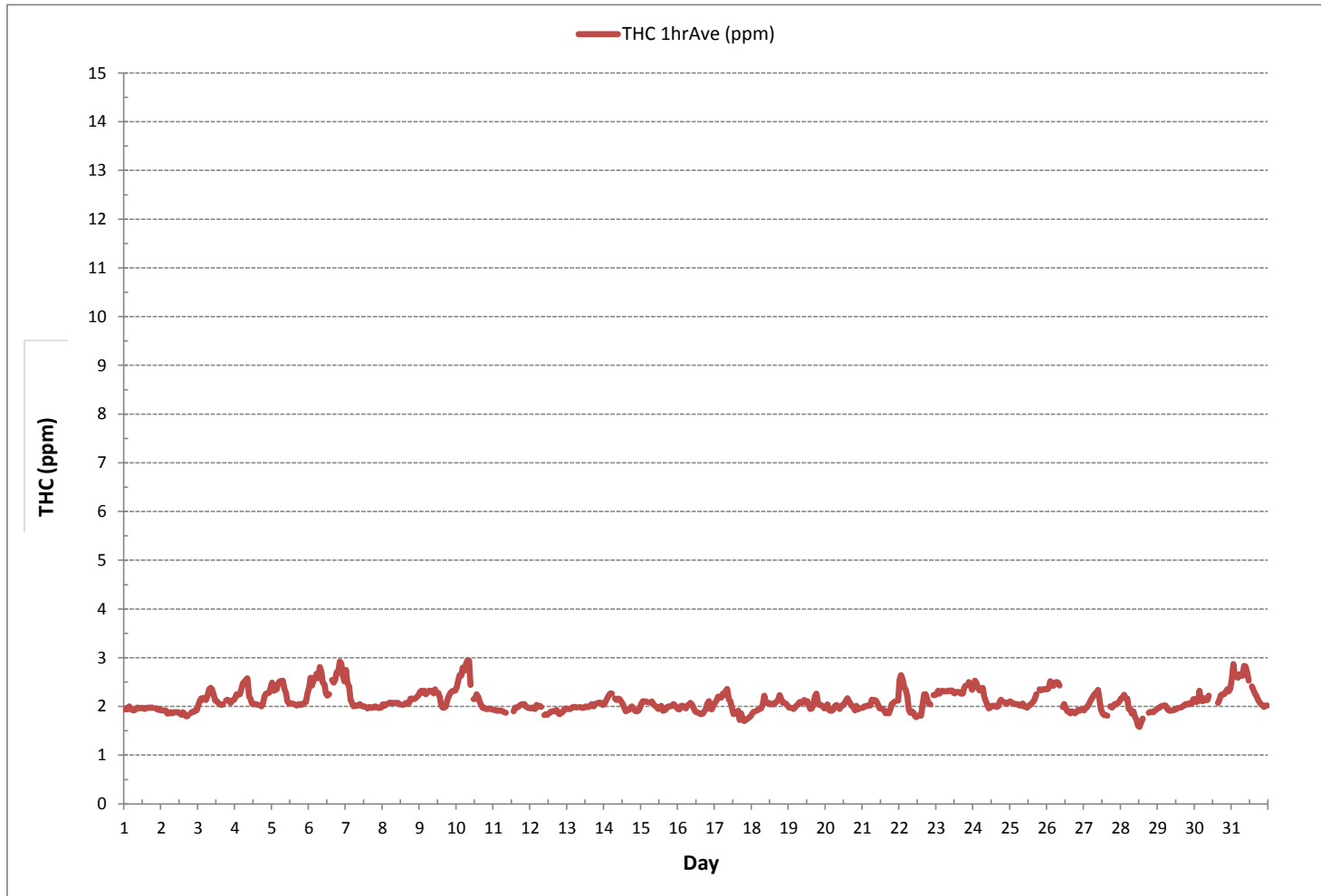
TRS[ppb] Calibration: LICA COLD LAKE SOUTH Monthly: 17/10 Type: Span



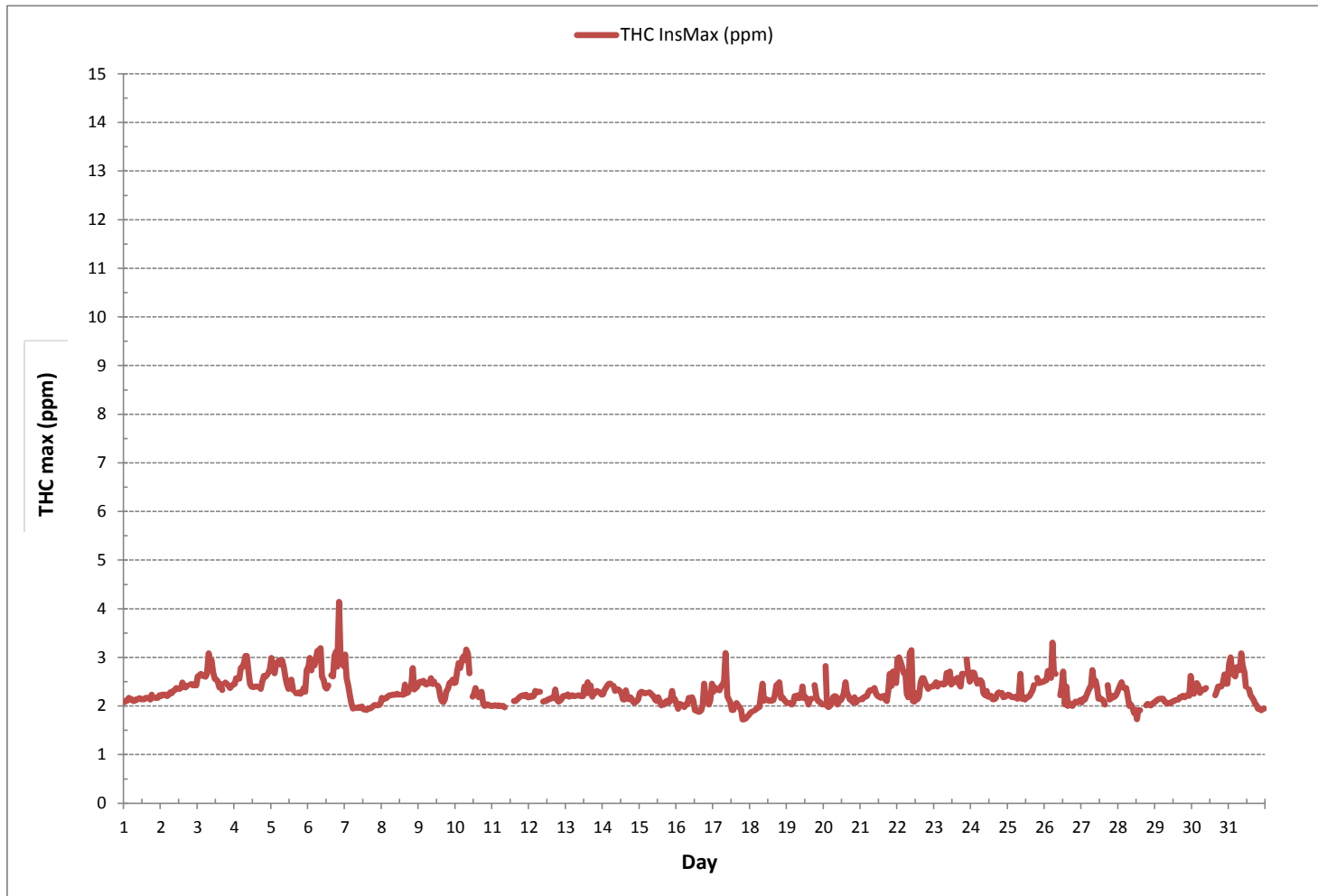
■ Span Meas
 — Span Ref
 — Span Low
 — Span High

TOTAL HYDROCARBON

TOTAL HYDROCARBONS Hourly Averages (THC ppm)



TOTAL HYDROCARBONS Instantaneous Maximum (THC ppm)



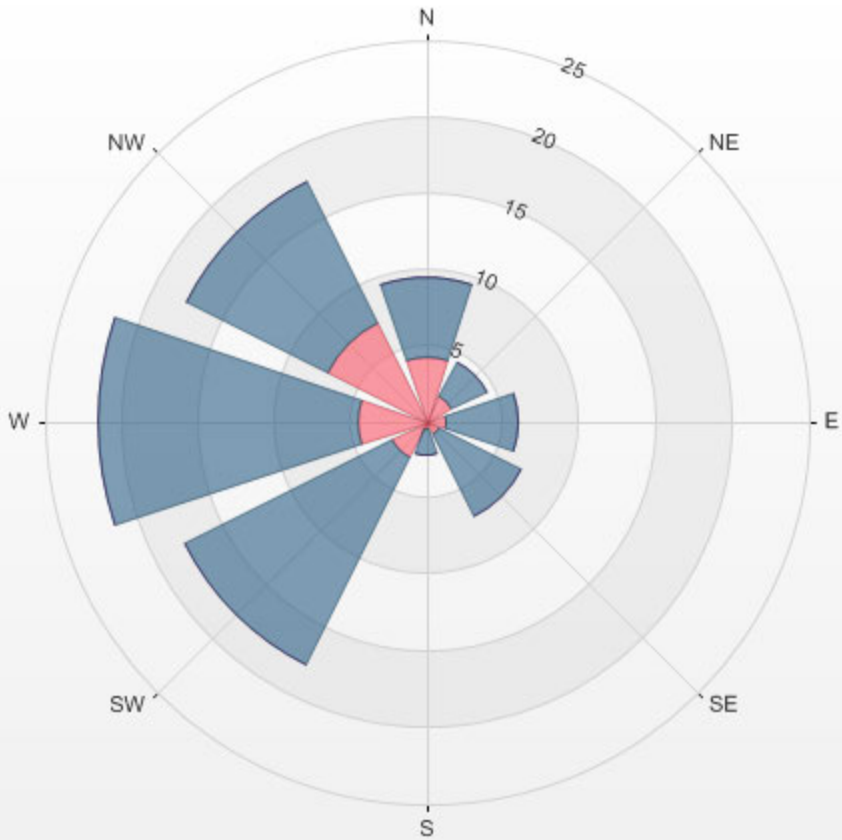
Wind: LICA COLD LAKE SOUTH
 Poll.: LICA COLD LAKE SOUTH-THC[ppm]
 Monthly: 17/10
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 14.04% Calm Avg: 2.30 [ppm]

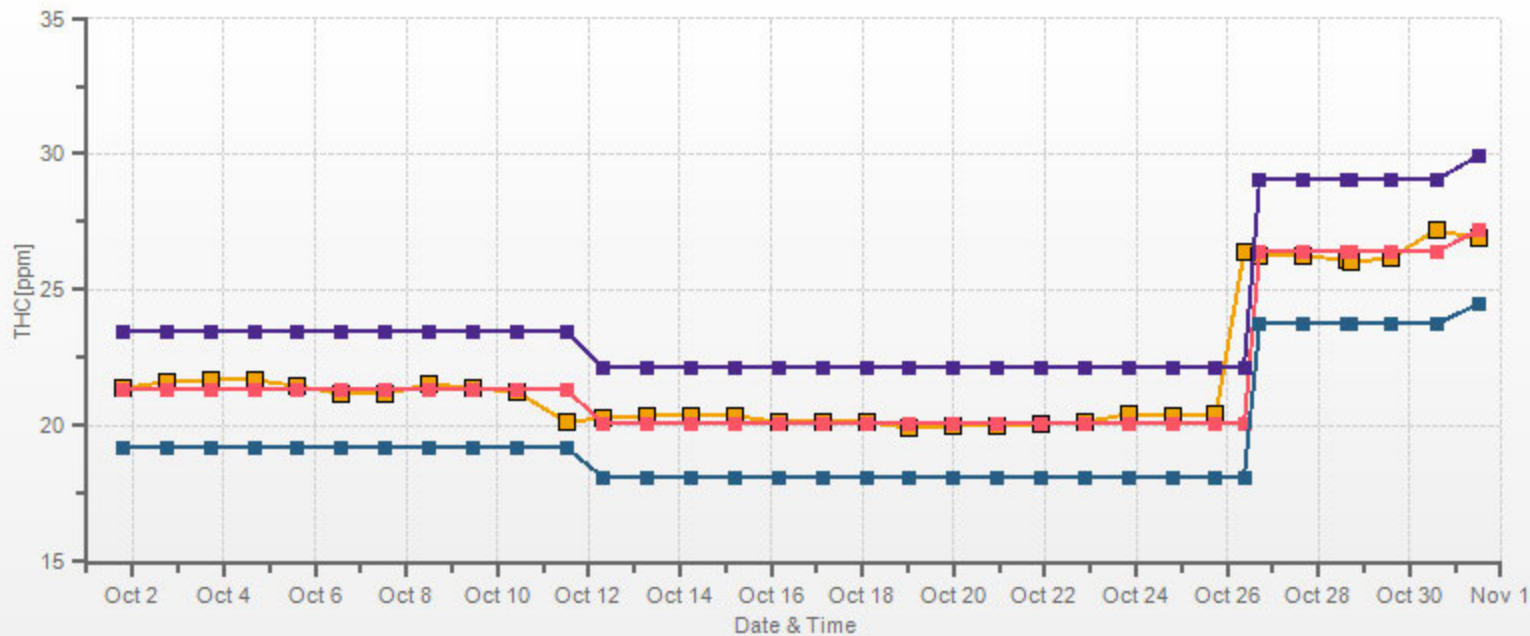
Direction	0.0-1.0	1.0-2.0	2.0-2.9	>2.9	Total
N	0.0	4.3	5.2	0.0	9.5
NE	0.0	1.9	2.6	0.0	4.4
E	0.0	1.3	4.7	0.0	6.0
SE	0.0	0.9	6.0	0.0	6.9
S	0.0	0.6	1.7	0.0	2.3
SW	0.0	2.6	15.2	0.0	17.8
W	0.0	4.6	16.9	0.0	21.5
NW	0.0	7.3	10.3	0.0	17.6
Summary	0.0	23.4	62.6	0.0	86.0

% Icon	Classes (ppm)	0	0.0-1.0	23	1.0-2.0	63	2.0-2.9	0	>2.9
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LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-THC[ppm] 2017/10/01 00:00 - 2017/10/31 23:00 Calm: 14.04% Calm Poll Avg: 2.30[ppm]



THC[ppm] Calibration: LICA COLD LAKE SOUTH Monthly: 17/10 Type: Span



Span Meas Span Ref Span Low Span High

OXIDES OF NITROGEN



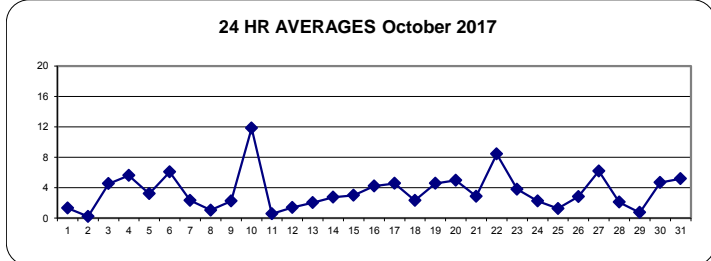
OXIDES OF NITROGEN Hourly Averages (NO_x ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY																													
1	1	1	1	2	2	2	1	1	1	1	1	2	1	1	2	1	2	1	1	S	2	1	1	1	1	1	2	1	24
2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	1	1	1	1	1	0	1	0	24
3	2	3	4	8	8	9	10	11	14	9	6	2	1	1	1	1	1	S	2	2	2	2	2	3	1	14	5	24	
4	3	4	4	5	6	10	10	18	14	5	4	4	2	2	1	1	S	4	9	8	5	4	3	3	1	18	6	24	
5	3	2	3	3	6	8	9	7	6	4	2	1	1	1	1	S	2	2	2	1	2	2	3	3	1	9	3	24	
6	2	2	5	3	3	5	9	8	7	6	5	4	3	3	S	7	7	8	8	9	10	8	8	10	2	10	6	24	
7	7	9	8	4	3	2	2	1	1	2	1	1	1	S	1	1	1	1	1	1	1	1	1	2	1	9	2	24	
8	1	1	1	1	1	1	1	1	1	1	1	1	S	1	1	1	0	0	1	2	1	1	2	2	0	2	1	24	
9	3	1	1	2	1	2	2	2	2	2	3	S	4	3	2	1	1	2	1	2	4	4	4	3	1	4	2	24	
10	8	7	6	6	17	11	19	27	72	14	C	C	C	C	C	C	C	5	3	3	1	1	1	0	0	72	12	24	
11	1	0	0	0	0	1	2	2	1	S	2	1	1	1	1	0	0	0	0	0	0	0	0	0	0	2	1	24	
12	0	0	0	0	3	2	1	1	S	3	2	2	2	3	3	2	2	1	1	0	1	1	1	1	0	3	1	24	
13	1	2	2	2	2	2	S	4	2	2	1	2	2	3	2	1	2	2	2	3	3	2	1	1	1	4	2	24	
14	1	1	1	2	2	3	S	4	2	3	3	3	4	4	3	4	4	5	4	3	2	1	1	3	1	5	3	24	
15	4	5	5	5	5	S	4	3	2	2	2	2	2	3	2	2	2	3	4	2	3	3	2	2	2	5	3	24	
16	2	2	2	2	S	3	4	7	8	5	2	1	1	1	1	1	2	6	6	12	14	5	6	4	1	14	4	24	
17	5	3	3	S	9	13	6	10	12	7	5	4	2	3	5	4	3	6	4	1	0	0	0	0	0	0	13	5	24
18	0	0	S	1	0	1	1	2	2	1	0	1	0	1	1	3	5	9	12	5	4	2	1	1	0	12	2	24	
19	0	S	1	1	1	2	6	5	2	2	6	5	4	3	3	6	8	18	16	5	3	3	3	2	0	18	5	24	
20	S	3	3	2	4	4	14	9	4	3	3	4	4	5	6	6	6	6	4	2	4	3	2	S	2	14	5	24	
21	4	5	3	2	2	2	3	3	4	3	2	1	1	0	1	0	2	4	5	2	4	6	S	7	0	7	3	24	
22	18	22	17	15	26	20	9	7	6	4	2	2	1	2	2	3	5	6	5	5	S	6	6	1	26	8	24		
23	5	6	5	6	5	4	5	5	5	3	2	2	3	1	1	2	1	3	4	7	4	S	6	6	2	7	4	24	
24	3	3	2	2	2	3	8	4	5	3	0	0	0	1	0	0	0	0	11	S	1	1	1	2	0	11	2	24	
25	2	2	1	1	1	2	5	3	2	2	2	1	1	1	0	0	0	S	1	0	0	0	0	0	0	5	1	24	
26	0	1	3	5	5	5	5	5	3	2	2	3	1	1	2	1	1	S	2	2	5	5	3	3	0	5	3	24	
27	4	5	5	5	6	7	9	13	15	15	13	7	5	2	2	3	S	7	4	3	3	3	3	3	2	15	6	24	
28	4	3	2	2	2	4	7	6	7	5	3	1	0	0	S	1	0	0	0	0	0	1	0	0	0	7	2	24	
29	0	1	0	0	0	1	1	1	1	1	1	1	1	0	S	1	1	1	1	1	0	1	0	2	0	2	1	24	
30	6	5	4	5	3	6	4	4	4	5	3	2	1	S	4	4	4	6	6	5	7	12	4	4	1	12	5	24	
31	5	8	5	5	5	5	4	5	8	8	6	4	S	5	6	6	9	6	4	5	4	2	2	2	2	9	5	24	
HOURLY MAX	18	22	17	15	26	20	19	27	72	15	13	7	5	5	6	7	9	18	16	12	14	12	8	10					
HOURLY AVG	3	4	3	3	4	5	5	6	7	4	3	2	2	2	2	2	3	4	4	3	3	3	2	2					

STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

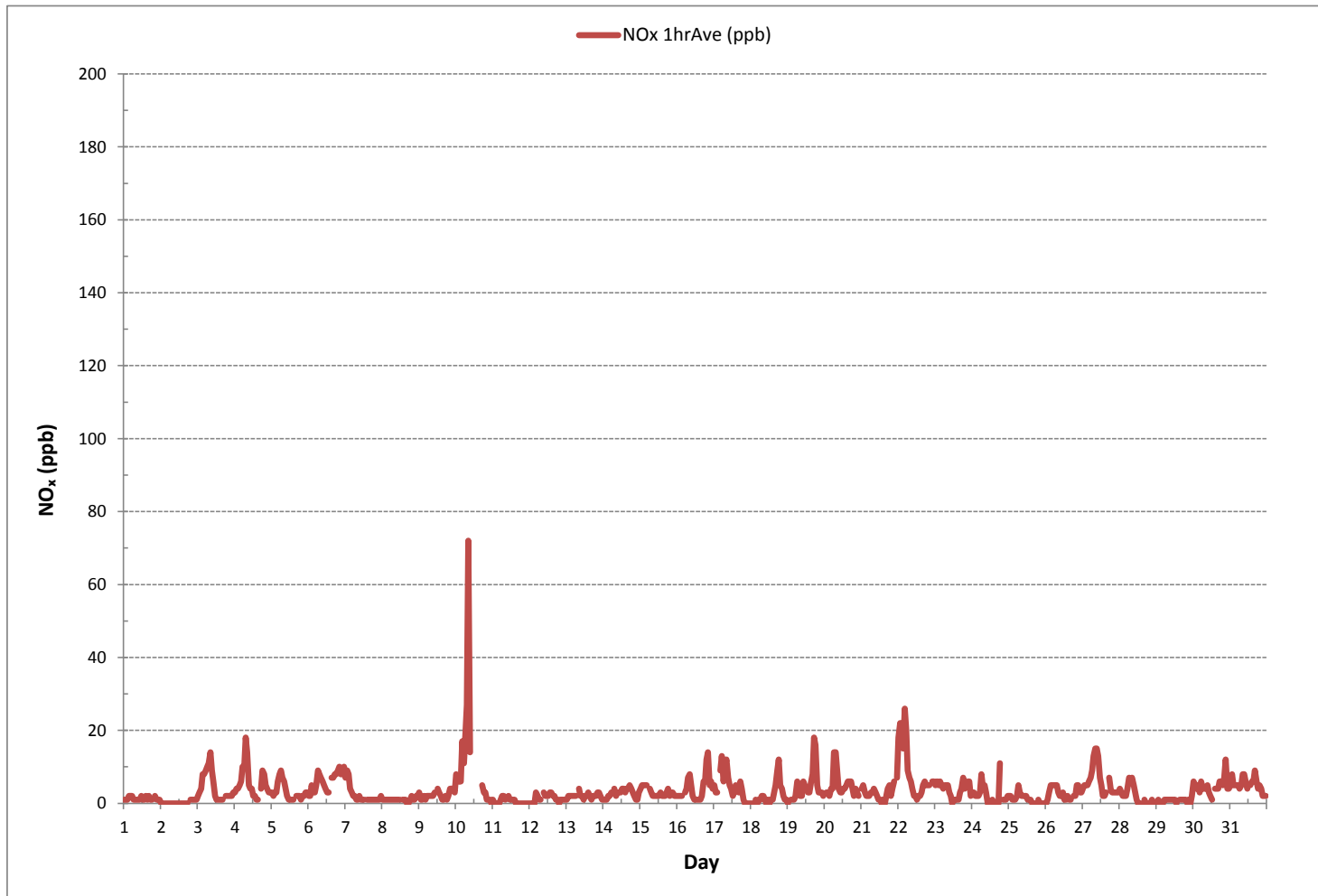
24 HR AVERAGES October 2017



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	623			
MINIMUM 1-HR AVERAGE:	0 ppb	@ HOUR	0	ON DAY 2
MAXIMUM 1-HR AVERAGE:	72 ppb	@ HOUR	8	ON DAY 10
MAXIMUM 24-HR AVERAGE:	12 ppb			ON DAY 10
IZS CALIBRATION TIME:	31 hrs	OPERATIONAL TIME:	744 hrs	
MONTHLY CALIBRATION TIME:	7 hrs	AMD OPERATION UPTIME:	100.0 %	
STANDARD DEVIATION:	4	MONTHLY AVERAGE:	3 ppb	

OXIDES OF NITROGEN Hourly Averages (NO_x ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Cold Lake Continuous Monitoring Station - October 2017

OXIDES OF NITROGEN Instantaneous Maximum (NO_x ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.	
DAY 1	2	2	2	3	3	3	2	2	1	2	2	2	2	1	3	2	2	2	1	S	4	2	1	1	1	4	2	24
2	1	1	1	0	0	0	1	1	1	0	1	1	1	1	1	1	1	1	S	3	2	2	1	2	0	3	1	24
3	6	4	7	11	11	12	12	15	18	13	8	5	5	2	3	7	6	S	3	2	3	2	3	4	2	18	7	24
4	5	5	8	6	10	12	13	30	20	11	5	7	5	3	2	1	S	10	12	36	10	6	5	5	1	36	10	24
5	7	5	7	15	11	17	13	10	9	7	3	1	2	2	3	S	4	2	2	2	5	2	5	4	1	17	6	24
6	3	5	8	8	5	12	18	20	12	9	9	9	4	9	S	9	9	10	10	10	13	10	10	11	3	20	10	24
7	8	11	11	6	5	4	3	2	4	3	2	2	2	S	3	1	1	2	2	2	1	1	2	2	1	11	3	24
8	2	2	2	2	2	1	2	2	1	1	1	1	S	2	1	1	2	1	3	14	2	4	5	4	1	14	3	24
9	3	4	3	10	3	4	3	2	3	4	S	5	4	4	2	3	3	3	5	14	8	8	5	2	14	5	24	
10	27	15	18	18	27	20	32	53	115	37	C	C	C	C	C	C	C	7	10	10	5	2	2	2	2	115	24	24
11	2	2	2	2	2	3	4	5	3	S	5	3	2	2	7	1	1	1	1	2	1	1	1	0	0	7	2	24
12	2	0	1	1	4	3	2	3	S	4	3	3	3	3	4	3	3	3	2	1	2	2	2	2	0	4	2	24
13	3	2	3	3	3	3	4	S	5	4	3	3	4	5	5	5	2	5	3	3	11	9	3	3	2	11	4	24
14	2	3	2	3	4	6	S	7	3	4	5	4	5	5	4	5	6	7	6	4	3	2	4	5	2	7	4	24
15	6	9	7	8	6	S	6	4	3	3	3	3	5	10	3	2	3	6	10	3	4	6	4	4	2	10	5	24
16	4	3	3	3	S	5	8	12	17	9	4	2	4	4	3	6	5	14	11	19	18	10	22	8	2	22	8	24
17	9	14	6	S	20	23	12	22	30	19	17	6	3	17	11	11	4	10	6	2	1	1	1	1	1	30	11	24
18	1	0	S	2	1	2	2	4	5	2	2	3	2	4	3	9	14	26	21	23	10	6	7	2	0	26	7	24
19	1	S	2	3	2	9	30	15	5	5	11	8	5	5	5	13	11	42	27	11	6	11	5	3	1	42	10	24
20	S	5	5	4	13	7	40	28	20	7	4	4	5	6	6	7	8	8	5	5	7	4	3	S	3	40	9	24
21	6	6	4	3	4	3	4	4	8	4	3	3	2	1	1	1	4	6	9	4	10	18	S	11	1	18	5	24
22	29	30	20	29	54	35	20	14	15	10	4	5	3	7	6	5	8	8	7	6	6	S	8	8	3	54	15	24
23	6	7	7	9	8	7	9	8	7	5	4	1	3	3	2	2	5	10	12	8	S	10	19	3	1	19	7	24
24	9	14	3	3	2	5	26	9	7	9	1	1	1	2	1	1	1	1	37	S	6	2	5	5	1	37	7	24
25	5	4	2	5	3	3	15	5	6	5	5	4	5	3	3	1	1	1	S	2	1	1	1	1	1	15	4	24
26	1	5	5	10	8	11	7	8	5	3	4	14	3	3	6	2	3	S	3	3	12	12	7	7	1	14	6	24
27	7	9	7	8	8	11	12	20	24	20	16	12	7	6	8	11	S	13	5	11	5	9	8	4	4	24	10	24
28	5	6	4	9	4	6	11	8	8	9	5	3	1	1	1	S	2	1	1	1	1	1	1	1	1	11	4	24
29	1	1	1	1	1	2	1	2	2	2	1	1	1	1	S	3	1	1	4	2	2	3	3	6	1	6	2	24
30	10	9	6	6	5	12	6	8	6	6	5	4	2	S	10	6	9	14	8	8	16	31	8	7	2	31	9	24
31	8	13	9	8	9	17	6	7	13	17	11	5	S	11	11	16	12	10	7	11	7	4	4	5	4	17	10	24
HOURLY MAX	29	30	20	29	54	35	40	53	115	37	17	14	7	17	11	16	14	42	37	36	18	31	22	11				
HOURLY AVG	6	7	6	7	8	9	11	11	13	8	5	4	3	4	4	5	5	8	8	7	6	6	5	4				

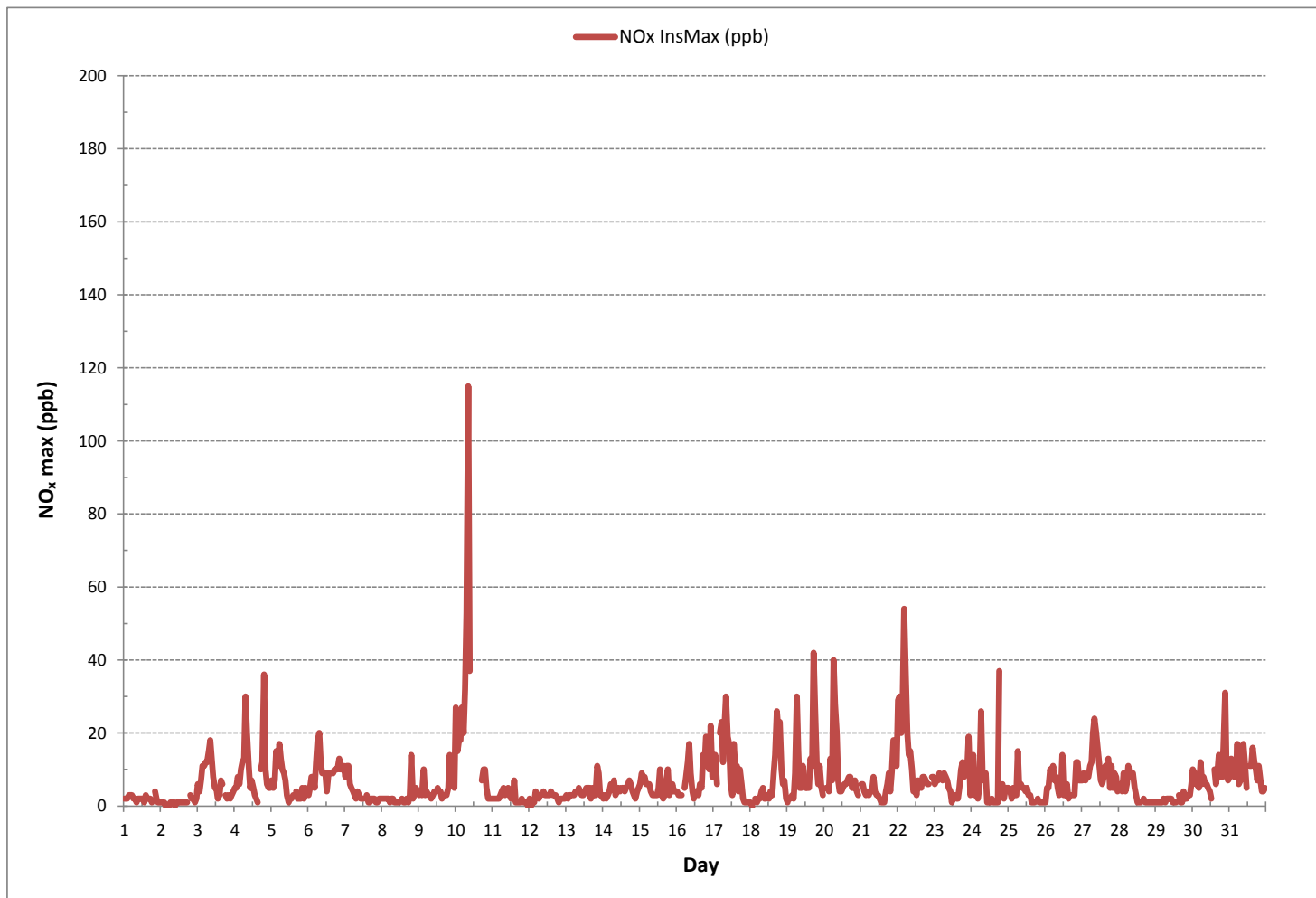
STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	699
MAXIMUM INSTANTANEOUS VALUE:	115 ppb @ HOUR 8 ON DAY 10
IZS CALIBRATION TIME:	31 hrs
MONTHLY CALIBRATION TIME:	7 hrs
OPERATIONAL TIME:	744 hrs
STANDARD DEVIATION:	8

OXIDES OF NITROGEN Instantaneous Maximum (NO_x ppb)



Wind: LICA COLD LAKE SOUTH
 Poll.: LICA COLD LAKE SOUTH-NO_x[ppb]
 Monthly: 17/10
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 13.84% Calm Avg: 6.66 [ppb]

Direction	0.0-24.3	24.3-48.7	48.7-73.0	>73.0	Total
N	9.4	0.0	0.0	0.0	9.4
NE	4.1	0.0	0.0	0.0	4.1
E	6.0	0.0	0.0	0.0	6.0
SE	6.9	0.0	0.0	0.0	6.9
S	2.3	0.0	0.0	0.0	2.3
SW	18.4	0.0	0.0	0.0	18.4
W	21.5	0.0	0.0	0.0	21.5
NW	17.6	0.0	0.0	0.0	17.6
Summary	86.2	0.0	0.0	0.0	86.2

% Icon Classes (ppb)

86

0.0-24.3

0

24.3-48.7

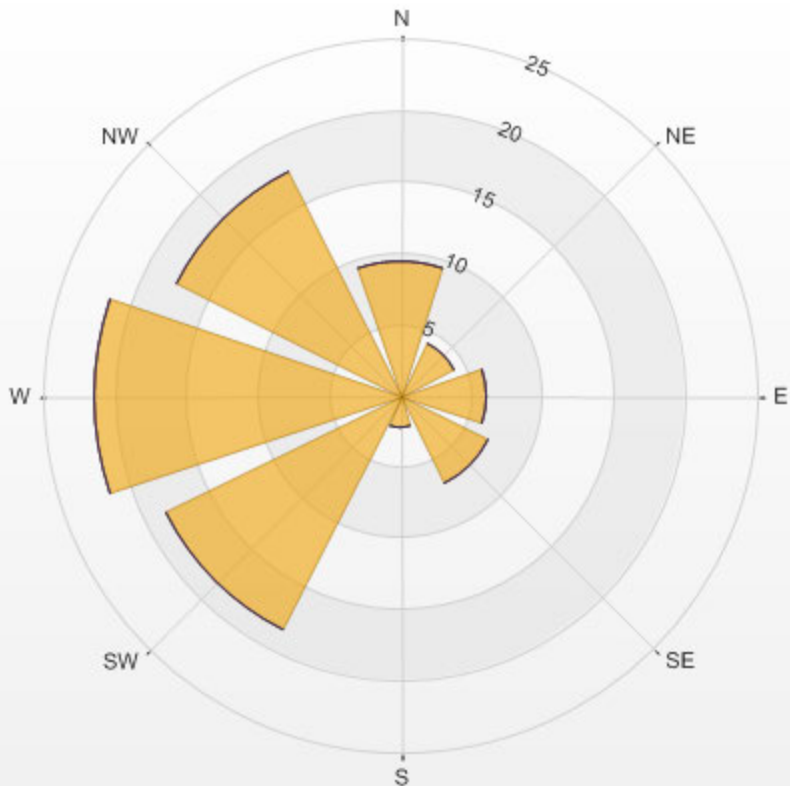
0

48.7-73.0

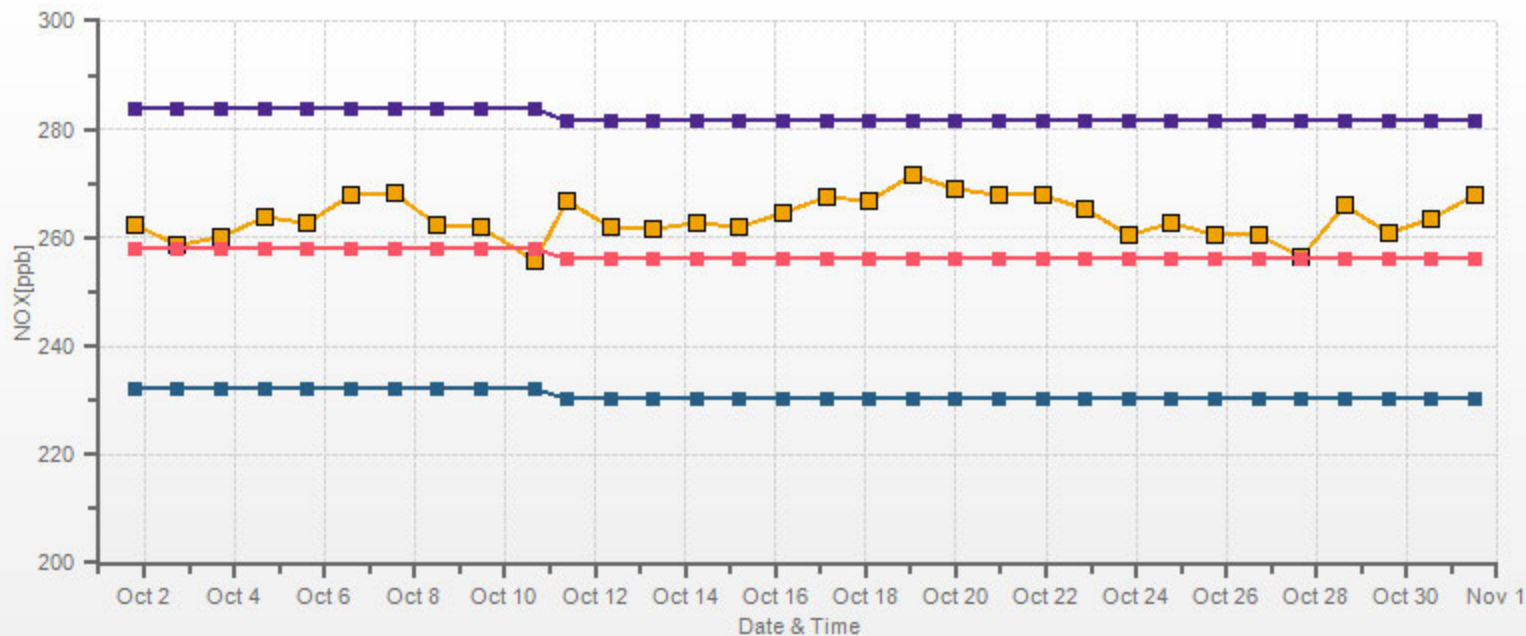
0

>73.0

LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-NOX[ppb] 2017/10/01 00:00 - 2017/10/31 23:00 Calm: 13.84% Calm Poll Avg: 6.66[ppb]



NOX[ppb] Calibration: LICA COLD LAKE SOUTH Monthly: 17/10 Type: Span



Span Meas Span Ref Span Low Span High

NITRIC OXIDES

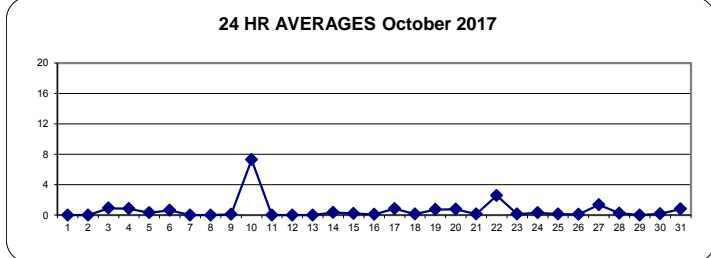
NITRIC OXIDE Hourly Averages (NO ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY MIN.	DAILY MAX.	24-HR AVG.	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59					
DAY																													
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	24	
2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	24	
3	0	0	0	0	0	0	1	4	7	4	3	1	1	0	0	0	0	S	0	0	0	0	0	0	0	0	7	1	24
4	0	0	0	0	0	0	1	7	6	2	1	1	1	0	0	0	S	0	0	1	0	0	0	0	0	0	7	1	24
5	0	0	0	1	1	1	1	1	1	1	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	1	0	24
6	0	0	0	0	0	1	3	3	2	2	1	1	0	0	S	1	1	0	0	0	0	0	0	0	0	0	3	1	24
7	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
8	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
9	0	0	0	0	0	0	0	0	0	0	0	S	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24
10	3	3	2	3	10	6	13	19	58	6	C	C	C	C	C	C	C	0	1	0	0	0	0	0	0	58	7	24	
11	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
12	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
13	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
14	0	0	0	0	0	0	S	0	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	1	0	24
15	0	0	0	0	0	S	0	1	1	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24
16	0	0	0	0	S	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24
17	0	0	0	S	2	4	0	2	4	2	2	1	0	1	1	1	0	0	0	0	0	0	0	0	0	0	4	1	24
18	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	1	0	24
19	0	S	0	0	0	0	1	1	1	1	2	2	1	1	1	1	1	3	1	0	0	0	0	0	0	3	1	24	
20	S	0	0	0	1	0	4	3	2	1	1	1	1	1	1	1	0	0	0	0	0	0	0	S	0	4	1	24	
21	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1	S	0	0	1	0	24
22	5	10	6	6	15	8	1	1	1	1	1	0	0	1	1	1	1	0	0	0	0	S	0	0	0	15	3	24	
23	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	S	0	1	0	0	1	0	24
24	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	5	S	0	0	0	0	0	5	0	24
25	0	0	0	0	0	0	1	0	1	0	1	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	1	0	24
26	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	S	0	0	0	0	0	0	0	1	0	24
27	0	0	0	0	0	0	1	3	7	7	6	3	2	1	1	0	S	0	0	0	0	0	0	0	0	0	7	1	24
28	0	0	0	0	0	0	1	0	2	2	1	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	2	0	24
29	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	24
30	0	0	0	0	0	0	0	0	0	1	1	0	0	S	0	0	0	0	0	0	0	0	2	0	0	2	0	24	
31	0	1	0	0	0	1	0	1	2	2	1	S	2	2	2	1	1	0	1	1	0	0	0	0	0	2	1	24	
HOURLY MAX	5	10	6	6	15	8	13	19	58	7	6	3	2	2	2	2	1	3	5	1	1	1	2	1	0				
HOURLY AVG	0	0	0	0	1	1	1	2	3	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0				

STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

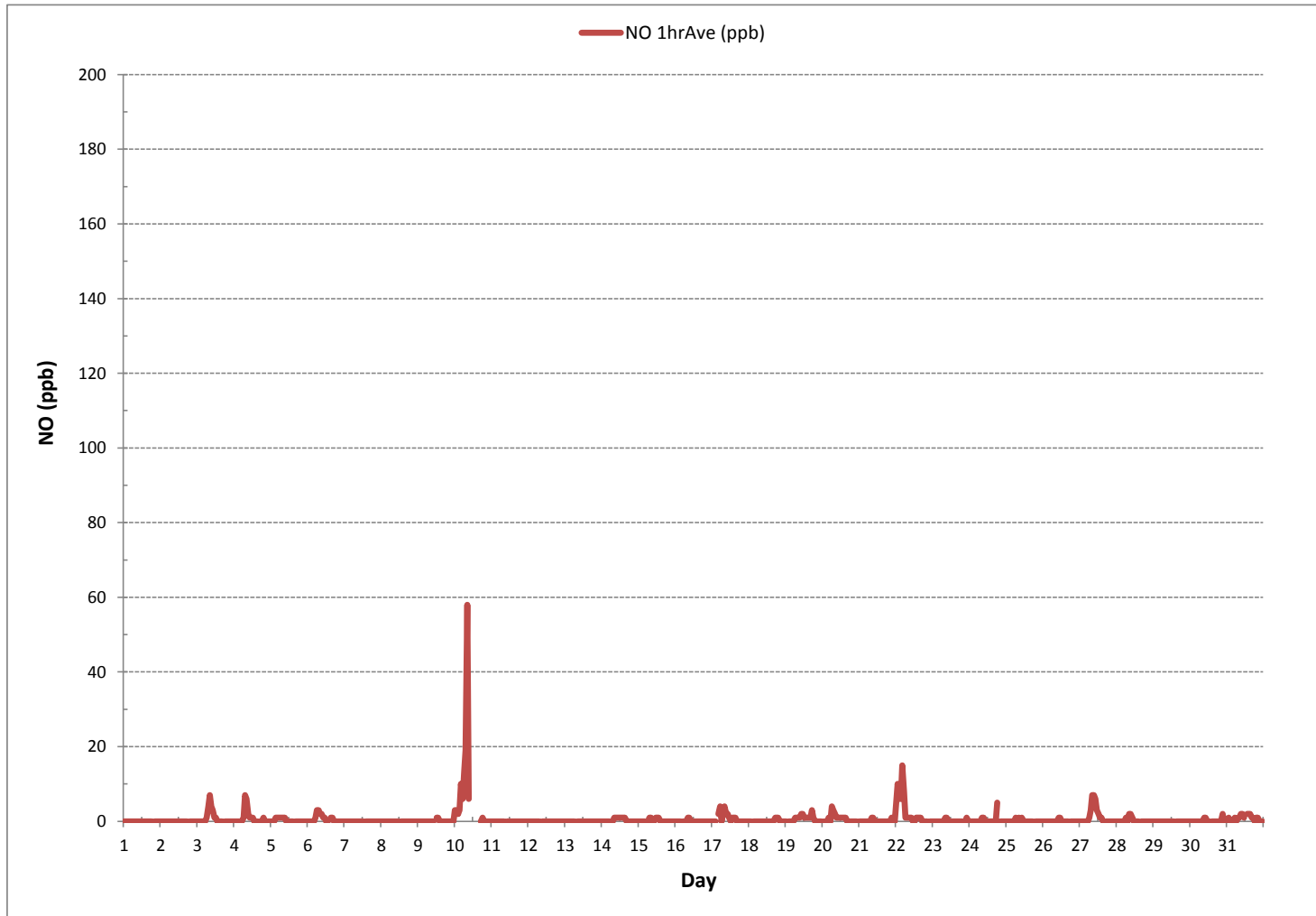
24 HR AVERAGES October 2017



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	155			
MINIMUM 1-HR AVERAGE:	0 ppb	@ HOUR	0	ON DAY 1
MAXIMUM 1-HR AVERAGE:	58 ppb	@ HOUR	10	ON DAY 10
MAXIMUM 24-HR AVERAGE:	7 ppb			ON DAY 10
IZS CALIBRATION TIME:	31 hrs	OPERATIONAL TIME:	744 hrs	
MONTHLY CALIBRATION TIME:	7 hrs	AMD OPERATION UPTIME:	100.0 %	
STANDARD DEVIATION:	3	MONTHLY AVERAGE:	1 ppb	

NITRIC OXIDE Hourly Averages (NO ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Cold Lake Continuous Monitoring Station - October 2017

NITRIC OXIDE Instantaneous Maximum (NO ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.		
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.			
DAY																														
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	24	
2	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	S	1	0	0	0	0	0	1	0	24	
3	1	1	3	2	2	1	4	7	12	7	4	2	3	4	2	4	4	S	0	0	1	0	0	1	0	0	12	3	24	
4	1	1	3	1	1	1	2	13	8	4	2	5	2	1	0	0	S	0	0	19	0	1	0	1	0	0	19	3	24	
5	2	1	2	12	3	6	3	2	2	2	1	0	1	1	1	S	0	0	0	0	0	0	0	1	0	0	12	2	24	
6	0	1	1	1	1	5	9	12	7	3	3	3	1	2	S	2	2	0	0	0	1	0	0	0	0	0	12	2	24	
7	1	1	1	0	1	1	1	0	1	1	1	0	0	S	0	0	0	0	0	1	0	0	0	0	0	0	1	0	24	
8	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	1	8	0	1	2	1	0	0	8	1	24	
9	0	0	0	3	1	0	0	0	0	0	1	S	1	1	1	0	0	1	1	1	1	4	1	1	1	0	0	4	1	24
10	19	7	10	10	18	14	22	41	97	29	C	C	C	C	C	C	C	2	4	3	2	1	1	1	1	1	97	17	24	
11	1	1	1	1	1	1	2	1	1	1	2	2	1	1	6	0	0	0	0	1	0	0	0	0	0	0	6	1	24	
12	0	0	0	0	0	0	0	0	S	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	1	0	24	
13	0	0	0	0	0	0	1	S	1	1	1	1	1	2	1	1	0	0	0	0	2	1	0	1	0	0	2	1	24	
14	0	0	0	0	1	1	S	2	1	1	2	1	2	2	2	1	2	0	1	1	1	0	1	1	0	0	2	1	24	
15	1	2	1	2	1	S	2	1	1	1	1	1	2	2	3	1	1	2	2	0	0	1	1	2	0	0	3	1	24	
16	1	1	1	1	S	1	1	1	3	2	1	0	1	1	1	5	0	2	1	3	2	2	10	0	0	0	10	2	24	
17	1	3	1	S	10	11	1	6	27	10	5	4	1	8	3	8	0	1	0	0	0	0	0	0	0	0	27	4	24	
18	0	0	S	0	0	1	0	1	1	1	1	1	0	1	1	2	4	8	6	11	2	1	3	0	0	0	11	2	24	
19	0	S	1	1	0	2	8	4	2	1	4	3	1	2	1	3	2	21	5	1	1	3	1	1	0	0	21	3	24	
20	S	2	2	1	13	1	17	11	9	2	3	1	1	2	2	1	1	0	0	1	2	1	0	S	0	0	17	3	24	
21	0	0	0	0	1	1	1	1	2	1	1	1	0	0	0	0	0	0	1	0	2	9	S	3	0	0	9	1	24	
22	13	17	8	21	40	21	8	4	5	16	2	2	2	2	1	9	0	0	1	1	1	S	1	1	0	0	40	8	24	
23	1	1	1	2	1	1	1	1	2	1	1	0	1	1	1	0	1	0	0	1	S	1	5	1	0	0	5	1	24	
24	1	9	0	0	0	0	3	1	1	1	0	0	0	0	0	0	0	0	19	S	2	0	2	1	0	0	19	2	24	
25	1	1	1	1	1	1	5	2	2	1	2	2	1	2	1	0	0	0	S	0	0	0	0	0	0	0	5	1	24	
26	0	2	1	3	1	4	1	1	1	1	2	9	2	1	5	1	1	S	0	0	1	3	2	1	0	0	9	2	24	
27	2	2	1	1	1	3	3	9	15	10	10	6	6	2	5	4	S	3	0	5	0	3	2	0	0	0	15	4	24	
28	0	1	0	5	0	2	3	1	3	3	2	1	0	0	0	S	0	0	0	0	0	0	0	0	0	0	5	1	24	
29	0	0	0	0	0	0	0	0	0	0	0	0	0	1	S	1	0	0	1	0	0	1	1	1	0	0	1	0	24	
30	2	1	2	1	3	1	0	1	1	1	3	1	1	S	2	1	3	3	0	1	4	12	2	2	0	0	12	2	24	
31	2	2	2	1	1	9	1	2	3	11	4	2	S	8	6	6	3	2	1	5	3	1	1	2	1	1	11	3	24	
HOURLY MAX	19	17	10	21	40	21	22	41	97	29	10	9	6	8	6	8	9	21	19	19	4	12	10	3						
HOURLY AVG	2	2	1	2	3	3	3	4	7	4	2	2	1	2	2	2	1	2	2	2	1	1	1	1						

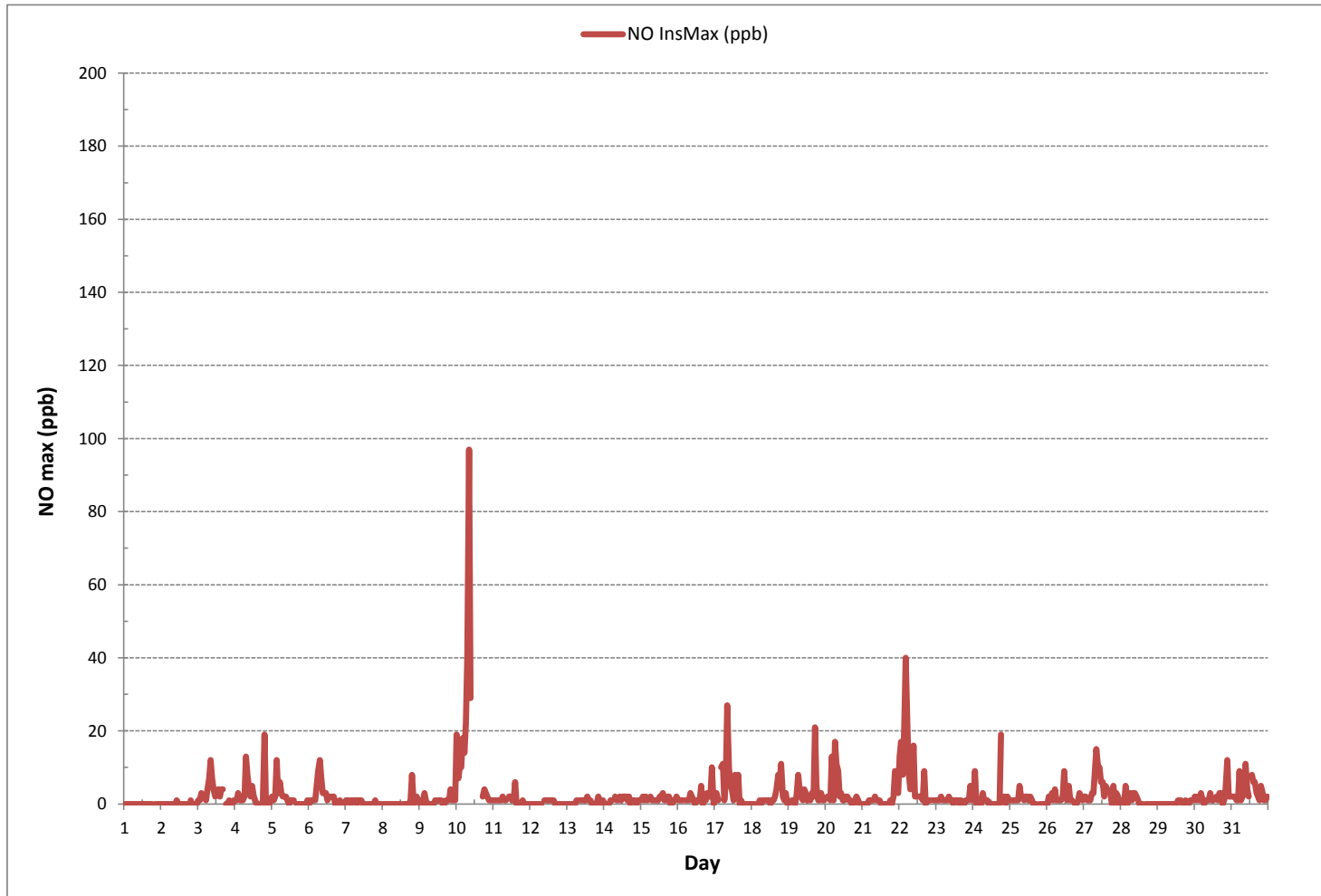
STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	455
MAXIMUM INSTANTANEOUS VALUE:	97 ppb @ HOUR 8 ON DAY 10
IZS CALIBRATION TIME:	31 hrs
MONTHLY CALIBRATION TIME:	7 hrs
STANDARD DEVIATION:	5
OPERATIONAL TIME:	744 hrs

NITRIC OXIDE Instantaneous Maximum (NO ppb)



Wind: LICA COLD LAKE SOUTH
 Poll.: LICA COLD LAKE SOUTH-NO[ppb]
 Monthly: 17/10
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 13.84% Calm Avg: 2.04 [ppb]

Direction	0.0-19.7	19.7-39.3	39.3-59.0	>59.0	Total
N	9.4	0.0	0.0	0.0	9.4
NE	4.1	0.0	0.0	0.0	4.1
E	6.0	0.0	0.0	0.0	6.0
SE	6.9	0.0	0.0	0.0	6.9
S	2.3	0.0	0.0	0.0	2.3
SW	18.4	0.0	0.0	0.0	18.4
W	21.5	0.0	0.0	0.0	21.5
NW	17.6	0.0	0.0	0.0	17.6
Summary	86.2	0.0	0.0	0.0	86.2

% Icon Classes (ppb)

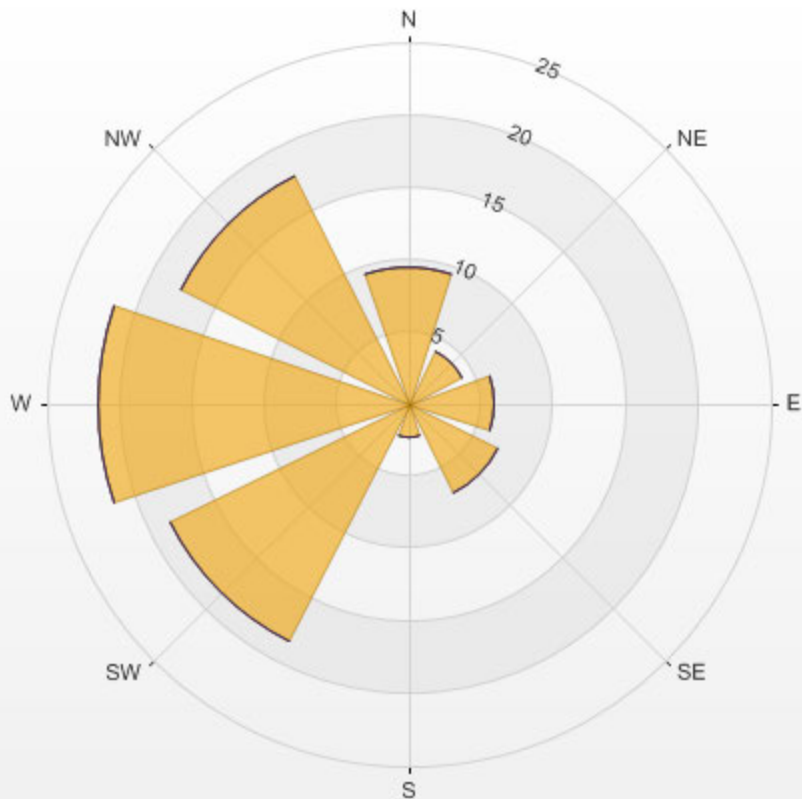
86 0.0-19.7

0 19.7-39.3

0 39.3-59.0

0 >59.0

LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-NO[ppb] 2017/10/01 00:00 - 2017/10/31 23:00 Calm: 13.84% Calm Poll Avg: 2.04[ppb]



NITROGEN DIOXIDE

NITROGEN DIOXIDE Hourly Averages (NO₂ ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY																													
1	1	1	1	2	2	2	1	1	1	1	1	2	1	1	1	1	1	1	1	S	2	1	1	1	1	1	2	1	24
2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	1	1	1	1	1	0	1	0	24
3	2	3	4	7	8	9	8	7	7	5	3	2	1	0	1	1	1	S	2	2	2	2	2	3	0	9	4	24	
4	3	4	4	5	6	10	10	11	9	3	2	3	2	1	1	1	S	4	9	7	5	4	3	3	1	11	5	24	
5	3	2	2	3	5	7	8	6	4	3	1	1	1	1	1	S	2	2	2	1	2	2	3	3	1	8	3	24	
6	2	2	5	3	3	4	7	5	4	4	3	3	2	3	S	7	6	7	8	9	9	8	8	10	2	10	5	24	
7	7	9	8	4	3	2	2	1	1	2	1	1	1	S	1	1	1	1	1	1	1	1	1	2	1	9	2	24	
8	1	1	1	1	1	1	1	1	1	1	1	1	S	1	1	1	0	0	1	2	1	1	2	2	0	2	1	24	
9	3	1	1	2	1	2	2	2	1	2	3	S	3	2	1	1	1	2	1	2	4	4	4	3	1	4	2	24	
10	5	5	4	3	7	5	6	8	14	7	C	C	C	C	C	C	C	4	3	2	1	1	0	0	14	4	24		
11	0	0	0	0	0	1	1	1	1	S	2	1	1	0	0	0	0	0	0	0	0	0	0	0	2	0	0	24	
12	0	0	0	0	3	2	1	1	S	3	2	2	2	2	2	2	2	1	1	0	1	1	1	1	0	3	1	24	
13	1	2	2	2	2	2	S	3	2	1	1	2	2	2	2	2	1	2	2	2	3	3	2	1	1	3	2	24	
14	1	1	1	2	2	3	S	3	2	2	2	2	3	2	2	3	4	5	4	3	2	1	1	3	1	5	2	24	
15	4	5	4	4	4	S	4	2	2	1	1	1	2	2	1	2	2	3	4	2	3	3	2	2	1	5	3	24	
16	2	2	2	2	S	3	4	7	7	4	2	1	1	1	1	1	2	6	5	12	14	5	5	4	1	14	4	24	
17	5	3	2	S	6	9	6	8	7	5	4	3	2	2	4	4	3	6	4	1	0	0	0	0	0	9	4	24	
18	0	0	S	1	0	1	1	2	1	0	0	0	0	1	1	2	4	8	11	4	3	2	1	1	0	11	2	24	
19	0	S	1	1	1	2	5	5	2	2	4	3	3	2	2	5	7	15	15	5	3	3	2	2	0	15	4	24	
20	S	3	2	2	3	3	10	11	7	3	2	3	3	4	5	6	6	4	2	4	2	2	S	2	11	4	24		
21	4	5	3	2	2	2	3	3	4	2	1	1	0	0	0	0	1	4	5	2	4	6	S	6	0	6	3	24	
22	13	12	10	9	12	12	8	6	5	2	2	1	1	2	2	3	5	6	5	5	S	S	6	6	1	13	6	24	
23	4	6	5	5	5	4	5	5	4	2	1	0	1	1	1	1	2	4	7	4	S	5	5	2	0	7	3	24	
24	3	3	2	2	2	3	8	4	4	2	0	0	0	1	0	0	0	0	6	S	1	1	1	1	0	8	2	24	
25	2	1	1	1	1	2	4	2	2	2	1	1	0	0	0	0	0	0	S	1	0	0	0	0	0	4	1	24	
26	0	1	2	5	5	5	5	4	2	2	2	2	1	1	1	1	S	2	2	5	5	3	3	0	5	3	24		
27	3	5	5	5	6	7	8	10	8	8	7	4	3	2	2	2	S	7	4	3	3	3	3	3	2	10	5	24	
28	4	3	2	2	2	4	6	6	5	3	2	1	0	0	0	S	1	0	0	0	0	1	0	0	0	6	2	24	
29	0	1	0	0	0	1	1	1	1	1	1	0	0	0	S	1	1	1	1	1	0	1	0	2	0	2	1	24	
30	5	5	4	5	3	6	4	4	3	4	2	2	1	S	4	4	4	6	6	5	6	10	4	4	1	10	4	24	
31	4	8	5	5	5	5	4	5	7	6	4	3	S	3	4	5	7	5	4	4	4	2	2	2	2	8	4	24	
HOURLY MAX	13	12	10	9	12	12	10	11	14	8	7	4	3	3	4	7	7	15	15	12	14	10	8	10					
HOURLY AVG	3	3	3	3	3	4	5	4	4	3	2	2	1	1	1	2	2	4	4	3	3	3	2	2					

STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

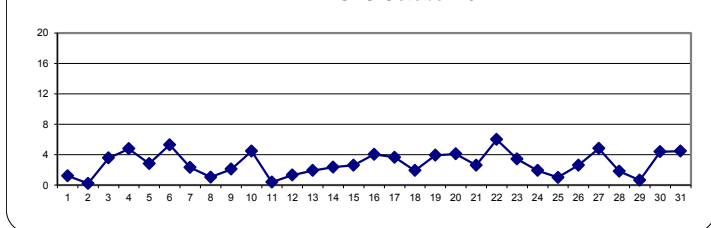
OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT: 1-HR 159 ppb

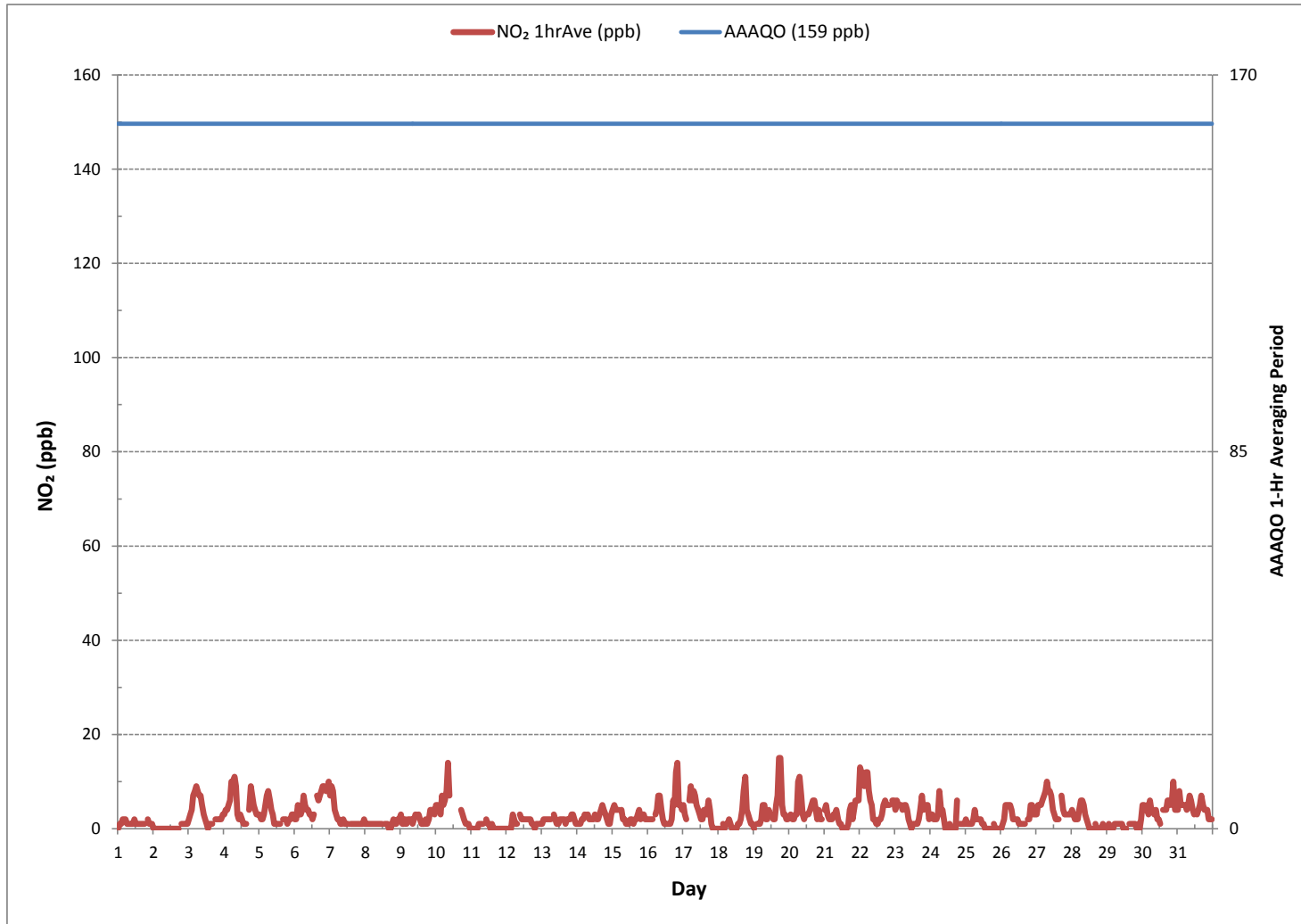
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0			
NUMBER OF NON-ZERO READINGS:	612			
MINIMUM 1-HR AVERAGE:	0	ppb @ HOUR	0	ON DAY 2
MAXIMUM 1-HR AVERAGE:	15	ppb @ HOUR	17	ON DAY 19
MAXIMUM 24-HR AVERAGE:	6	ppb		ON DAY 22
IZS CALIBRATION TIME:	31	hrs	OPERATIONAL TIME:	744
MONTHLY CALIBRATION TIME:	7	hrs	AMD OPERATION UPTIME:	100.0 %
STANDARD DEVIATION:	3		MONTHLY AVERAGE:	3 ppb

24 HR AVERAGES October 2017



NITROGEN DIOXIDE Hourly Averages (NO₂ ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Cold Lake Continuous Monitoring Station - October 2017

NITROGEN DIOXIDE Instantaneous Maximum (NO₂ ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY 1	2	2	2	2	3	3	2	2	1	2	2	2	1	1	2	2	2	2	1	S	3	2	1	1	1	3	2	24	
2	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1	1	S	3	2	1	1	1	0	3	1	24	
3	5	4	6	10	10	11	10	9	8	6	4	3	3	1	1	3	4	S	3	2	2	2	3	4	1	11	5	24	
4	4	4	5	6	9	11	11	17	12	7	3	5	3	2	1	1	S	10	12	18	9	5	5	4	1	18	7	24	
5	5	4	5	8	9	11	10	8	6	5	2	1	2	2	S	3	2	2	2	2	4	2	5	4	1	11	5	24	
6	3	5	8	8	4	8	9	11	7	6	6	6	3	6	S	7	7	9	10	10	12	10	11	3	12	8	24		
7	8	10	10	6	5	3	2	2	2	2	2	1	1	S	3	1	1	1	1	2	1	1	2	2	1	10	3	24	
8	2	2	2	2	2	1	2	2	1	1	1	1	S	2	1	1	1	1	3	6	2	3	4	4	1	6	2	24	
9	3	3	3	7	2	3	3	3	2	2	3	S	5	3	3	2	3	3	2	4	10	7	8	4	2	10	4	24	
10	9	8	8	8	10	6	9	13	21	13	C	C	C	C	C	C	C	6	8	8	3	2	2	1	1	21	8	24	
11	1	1	1	1	1	2	2	4	2	S	4	2	1	1	4	1	1	1	1	1	0	1	0	0	0	4	1	24	
12	1	0	0	1	4	3	2	3	S	4	3	2	3	3	3	2	2	2	2	1	2	2	2	2	0	4	2	24	
13	2	2	3	3	3	3	3	S	5	3	2	2	3	4	4	4	2	4	3	3	9	9	3	2	2	9	4	24	
14	1	2	2	3	4	5	S	7	3	3	3	3	3	3	3	4	6	7	5	4	3	2	3	4	1	7	4	24	
15	5	7	6	7	6	S	6	3	2	2	2	2	3	9	2	2	2	5	9	3	4	5	4	3	2	9	4	24	
16	3	2	3	3	S	5	8	11	14	7	3	1	3	3	3	3	4	13	11	18	17	9	13	8	1	18	7	24	
17	9	11	5	S	11	12	10	16	18	13	12	4	3	9	9	5	4	9	6	2	1	1	0	1	0	18	7	24	
18	0	0	S	2	1	1	2	3	4	1	1	2	1	3	3	7	10	18	19	12	8	5	5	2	0	19	5	24	
19	1	S	2	3	2	7	22	11	3	3	7	5	3	3	3	11	11	22	22	10	5	8	4	2	1	22	7	24	
20	S	4	3	3	7	7	25	17	12	5	3	3	4	4	4	6	8	7	5	4	6	3	S	3	25	7	24		
21	5	6	4	3	4	3	4	3	7	3	2	2	1	1	1	1	4	6	9	4	9	10	S	9	1	10	4	24	
22	16	15	14	14	14	15	12	11	9	6	3	3	2	6	4	4	6	7	6	6	6	S	8	8	2	16	8	24	
23	6	7	6	7	7	7	8	8	5	4	2	1	2	2	1	2	4	10	12	6	S	9	15	3	1	15	6	24	
24	8	8	3	3	2	5	23	8	6	9	1	1	1	1	1	0	1	1	21	S	3	1	3	4	0	23	5	24	
25	4	3	2	4	2	3	10	4	4	4	4	3	4	3	2	0	0	1	S	2	1	1	1	1	0	10	3	24	
26	1	3	5	8	7	7	7	7	4	3	2	5	2	2	4	2	2	S	3	3	11	10	6	5	1	11	5	24	
27	5	8	7	7	8	9	10	12	11	10	8	6	4	4	3	7	S	11	5	6	5	6	6	4	3	12	7	24	
28	5	5	4	5	4	5	9	7	6	6	3	2	1	1	0	S	2	1	1	1	1	1	1	1	0	9	3	24	
29	1	1	1	1	1	1	1	2	1	1	2	1	1	1	S	2	1	1	3	2	1	2	2	2	6	1	6	2	24
30	8	9	6	6	4	11	6	7	5	5	4	3	2	S	8	5	6	11	8	8	12	19	7	6	2	19	7	24	
31	7	11	7	7	8	10	5	6	11	9	8	4	S	6	8	11	10	9	6	7	5	3	2	3	2	11	7	24	
HOURLY MAX	16	15	14	14	14	15	25	17	21	13	12	6	5	9	9	11	11	22	22	18	17	19	15	11					
HOURLY AVG	4	5	4	5	5	6	8	7	6	5	3	3	2	3	3	3	4	6	7	5	5	5	4	4					

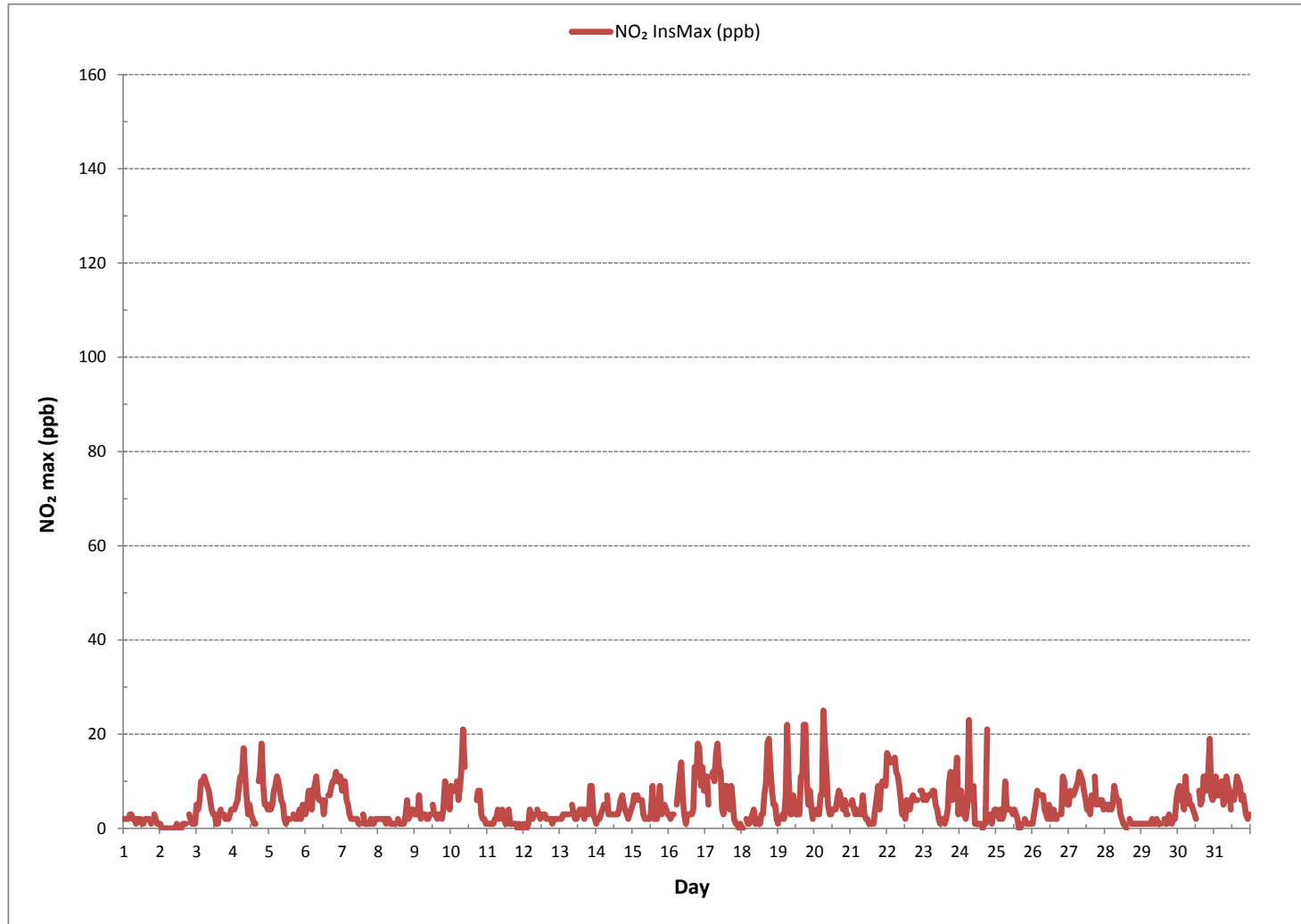
STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	681
MAXIMUM INSTANTANEOUS VALUE:	25 ppb @ HOUR 6 ON DAY 20
	VAR-VARIOUS
IZS CALIBRATION TIME:	31 hrs
MONTHLY CALIBRATION TIME:	7 hrs
STANDARD DEVIATION:	4
OPERATIONAL TIME:	744 hrs

NITROGEN DIOXIDE Instantaneous Maximum (NO₂ ppb)



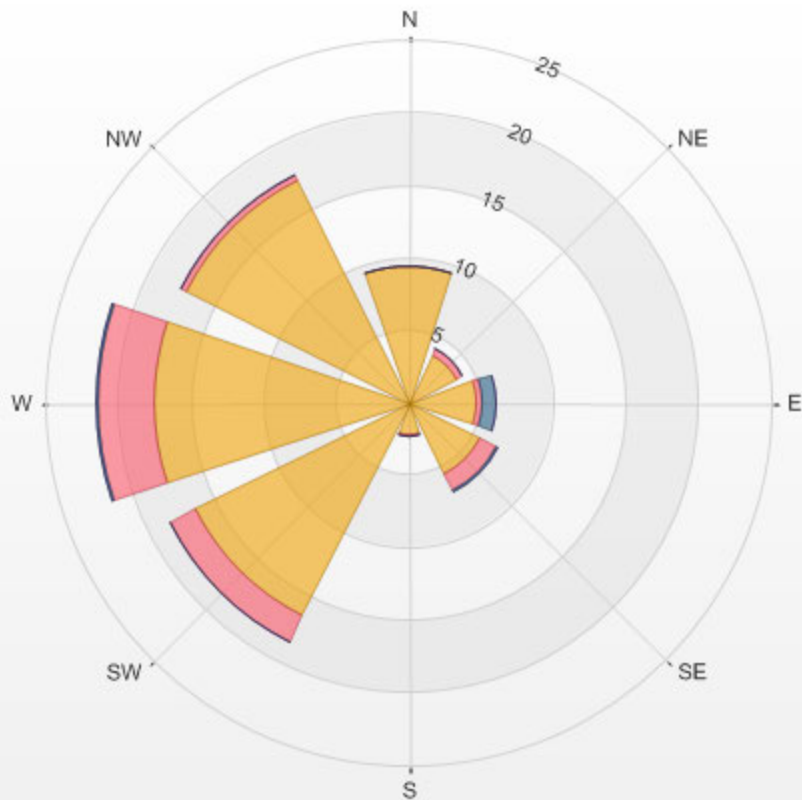
Wind: LICA COLD LAKE SOUTH
 Poll.: LICA COLD LAKE SOUTH-NO₂[ppb]
 Monthly: 17/10
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 13.84% Calm Avg: 4.62 [ppb]

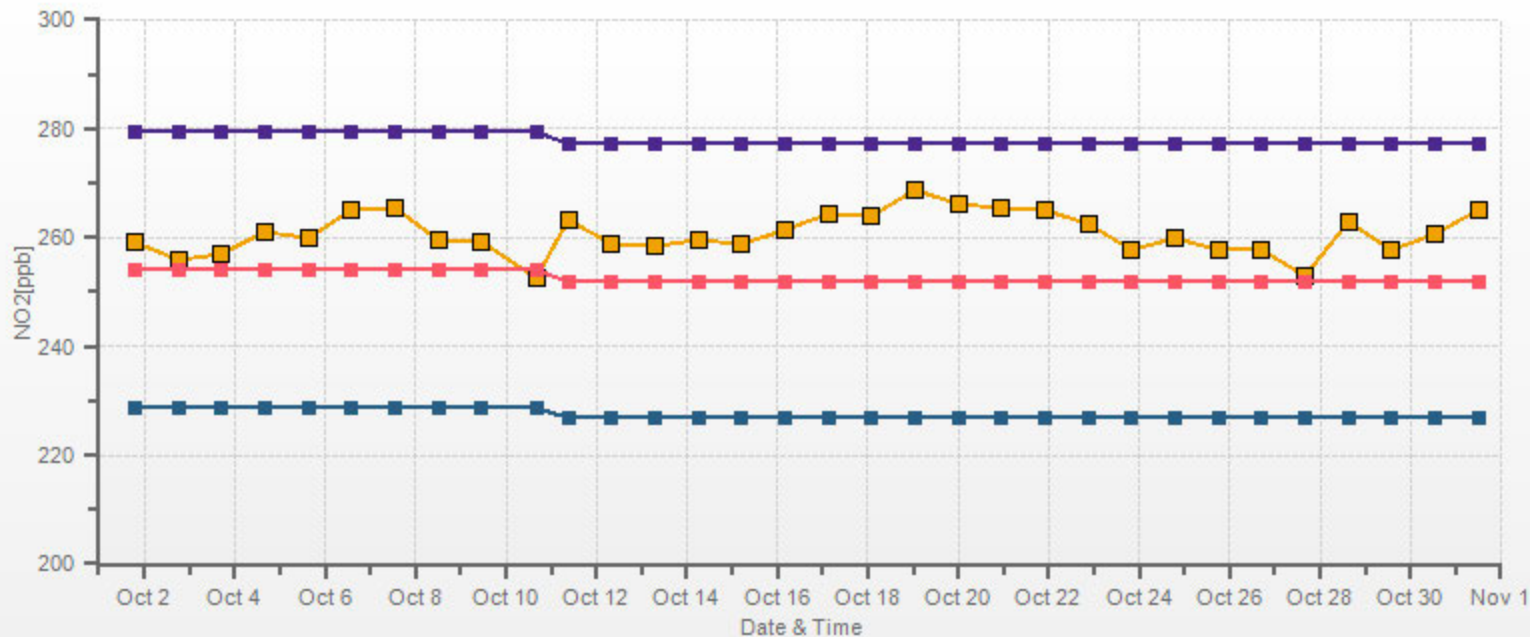
Direction	0.0-5.3	5.3-10.7	10.7-16.0	>16.0	Total
N	9.4	0.0	0.0	0.0	9.4
NE	3.7	0.4	0.0	0.0	4.1
E	4.7	0.4	0.9	0.0	6.0
SE	5.6	1.1	0.1	0.0	6.8
S	2.1	0.1	0.0	0.0	2.3
SW	16.4	2.0	0.0	0.0	18.4
W	17.6	3.9	0.1	0.0	21.5
NW	17.1	0.4	0.0	0.0	17.6
Summary	76.6	8.4	1.1	0.0	86.2

% Icon Classes (ppb) 77 0.0-5.3 8 5.3-10.7 1 10.7-16.0 0 >16.0

LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-NO2[ppb] 2017/10/01 00:00 - 2017/10/31 23:00 Calm: 13.84% Calm Poll Avg: 4.62[ppb]



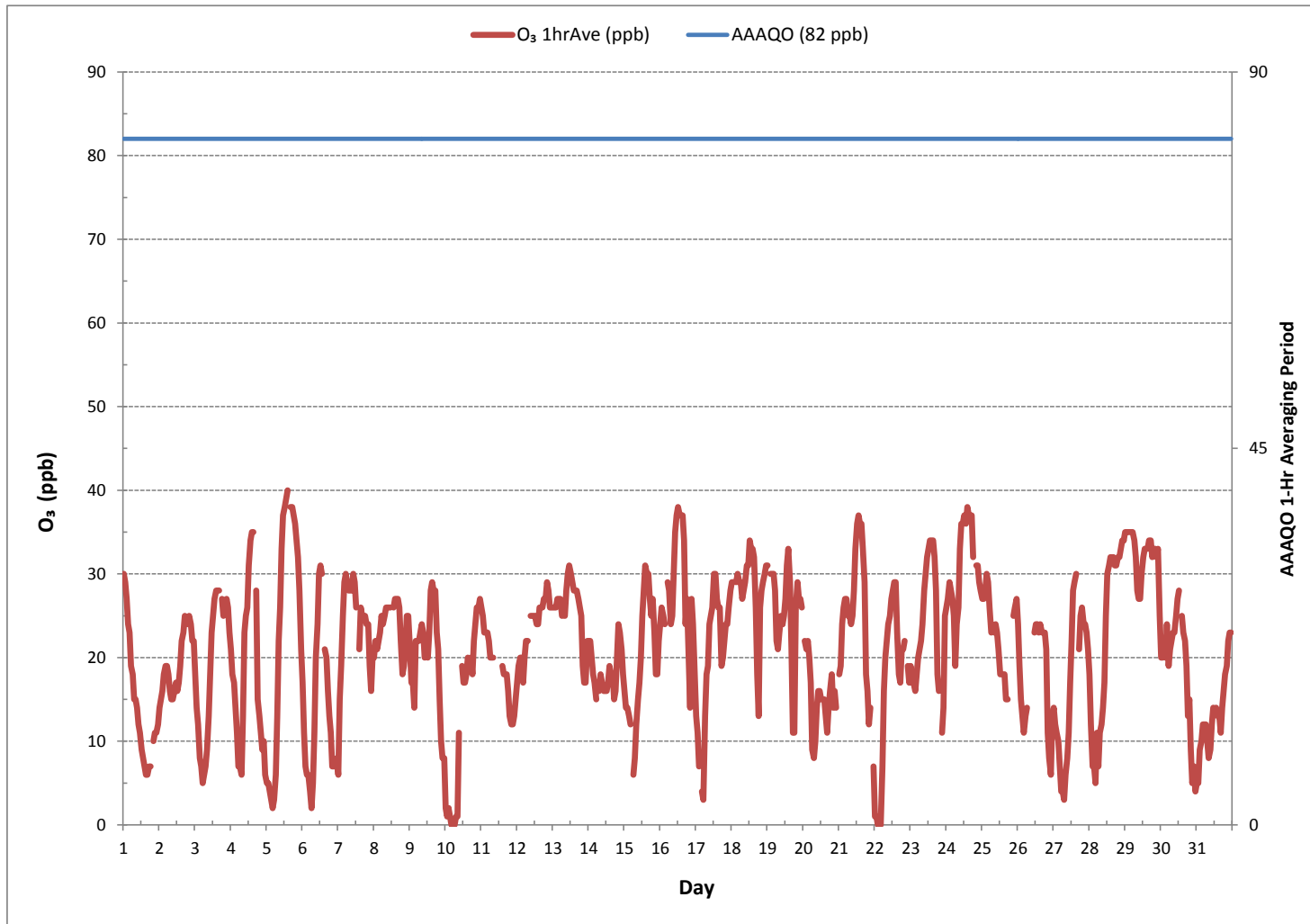
NO2[ppb] Calibration: LICA COLD LAKE SOUTH Monthly: 17/10 Type: Span



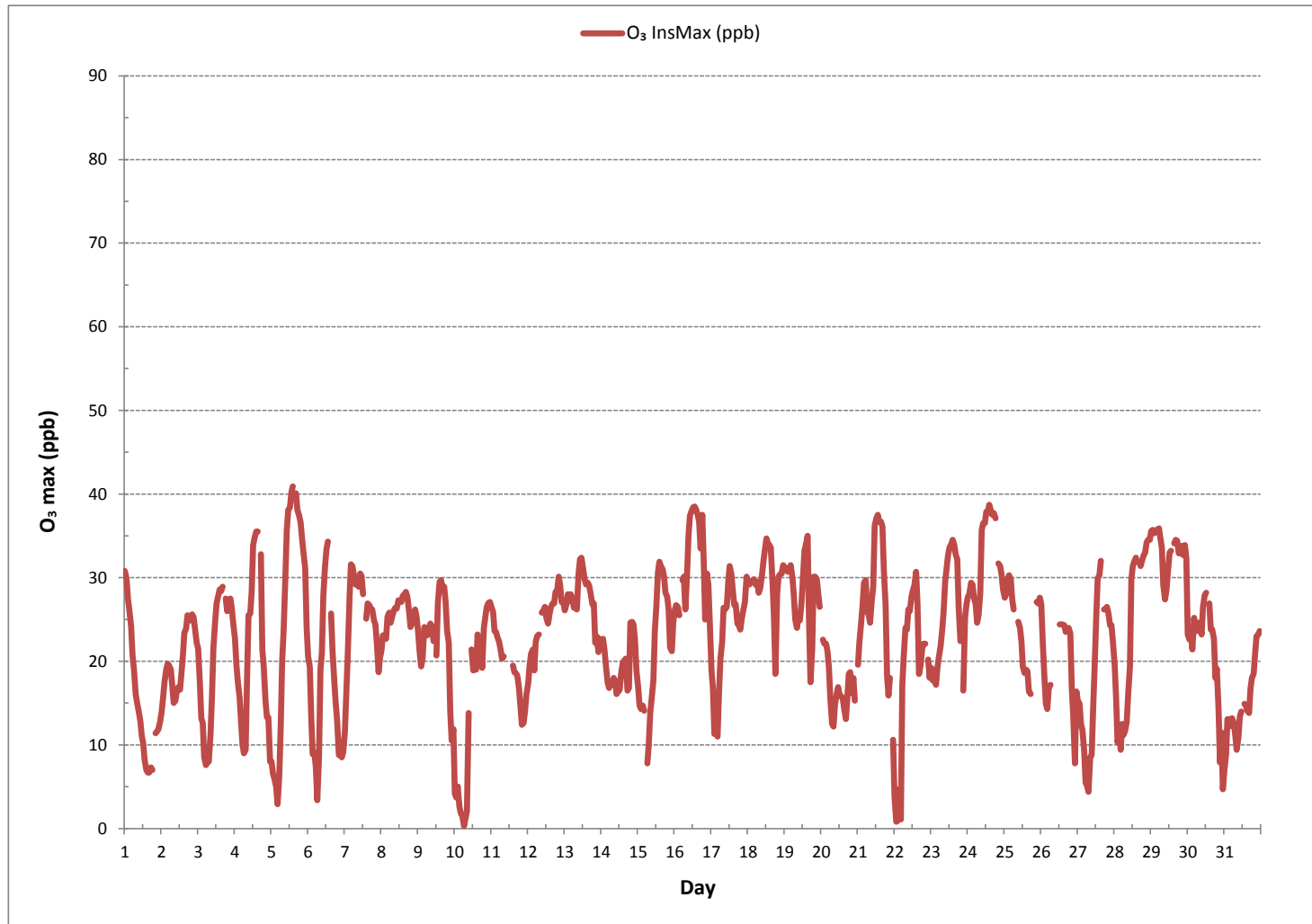
Span Meas Span Ref Span Low Span High

OZONE

OZONE Hourly Averages (O₃ ppb)



OZONE Instantaneous Maximum (O₃ ppb)



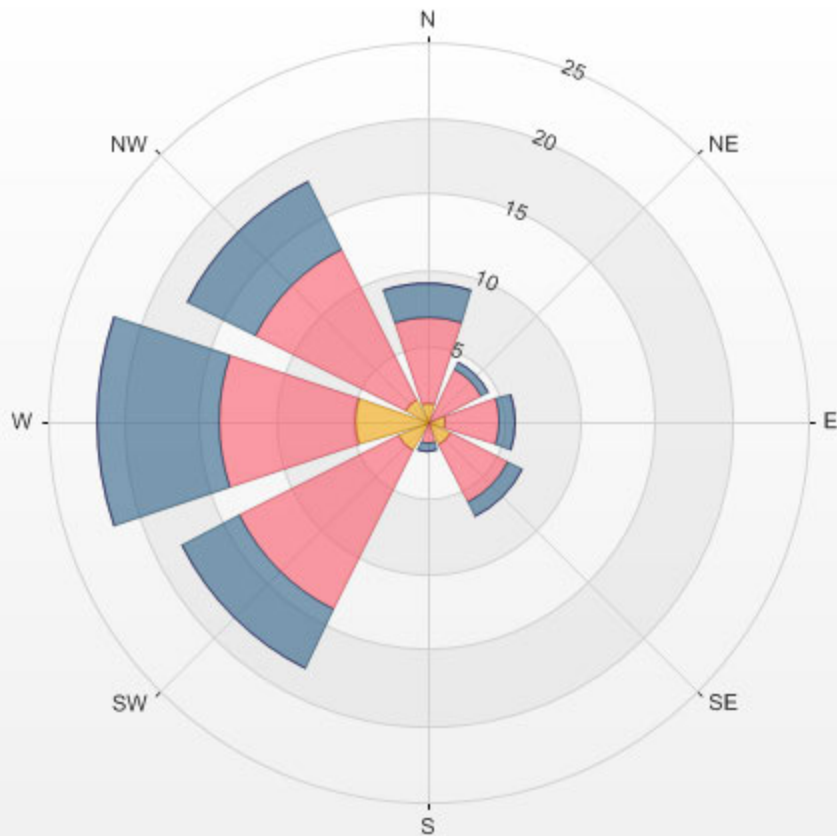
Wind: LICA COLD LAKE SOUTH
 Poll.: LICA COLD LAKE SOUTH-O₃[ppb]
 Monthly: 17/10
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

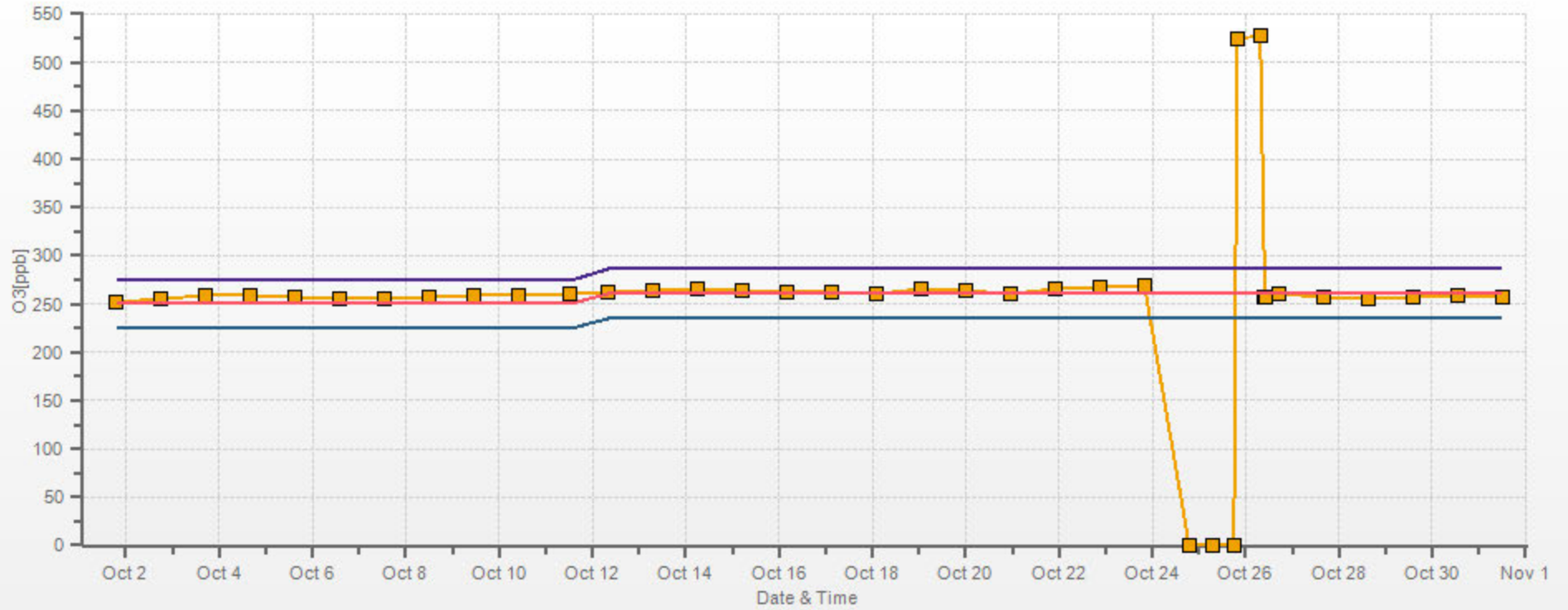
Calm: 14.12% Calm Avg: 11.89 [ppb]

Direction	0.0-13.7	13.7-27.3	27.3-41.0	>41.0	Total
N	1.3	5.6	2.2	0.0	9.1
NE	0.0	3.9	0.6	0.0	4.5
E	1.2	3.6	1.0	0.0	5.8
SE	1.7	4.2	1.0	0.0	6.9
S	0.0	1.4	0.6	0.0	2.0
SW	2.2	11.7	4.3	0.0	18.2
W	4.8	8.9	8.1	0.0	21.8
NW	1.6	11.1	5.0	0.0	17.7
Summary	12.7	50.4	22.8	0.0	85.9

% Icon Classes (ppb) 13 0.0-13.7 50 13.7-27.3 23 27.3-41.0 0 >41.0

LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-O3[ppb] 2017/10/01 00:00 - 2017/10/31 23:00 Calm: 14.12% Calm Poll Avg: 11.89[ppb]





Span Meas Span Ref Span Low Span High

PARTICULATE MATTER 2.5



PARTICULATE MATTER < 2.5 MICRONS Hourly Averages (PM_{2.5} µg/m³)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.	
DAY																												
1	2	2	2	2	3	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	3	1	24
2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	1	0	0	1	0	24
3	0	1	1	1	1	2	1	1	1	1	1	1	1	0	0	1	1	1	1	1	1	1	2	4	0	4	1	24
4	4	5	7	6	5	5	4	4	3	2	2	2	1	1	1	1	1	2	4	5	4	3	3	3	1	7	3	24
5	3	3	3	3	3	4	4	4	2	2	1	1	1	1	1	1	1	1	2	2	3	3	3	4	1	4	2	24
6	4	4	5	4	5	6	14	10	10	7	3	3	2	3	3	4	5	6	8	9	8	8	7	6	2	14	6	24
7	6	4	3	2	1	1	1	2	3	2	3	2	1	0	0	0	0	0	0	0	0	0	0	0	0	6	1	24
8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
9	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	2	1	1	1	1	1	1	0	2	1	24
10	13	6	2	3	3	3	3	4	6	2	2	4	3	2	3	2	2	2	2	2	2	1	2	2	1	13	3	24
11	2	2	2	2	2	2	2	2	3	3	3	2	2	C	3	2	1	1	1	1	1	0	0	0	0	3	2	24
12	0	0	0	0	1	1	1	1	2	2	2	2	3	5	6	6	5	4	2	1	2	2	2	2	0	6	2	24
13	2	2	3	3	3	3	3	3	2	2	2	2	2	2	3	3	3	3	3	3	3	3	3	3	2	3	3	24
14	3	2	3	3	4	5	7	9	8	10	10	12	11	9	8	8	8	8	6	5	4	3	2	2	2	12	6	24
15	2	2	2	2	2	2	2	2	2	1	2	2	2	2	1	1	1	1	2	1	1	1	1	1	1	2	2	24
16	1	1	2	2	2	1	1	2	2	1	1	1	1	1	1	1	1	3	2	3	5	3	2	1	1	5	2	24
17	2	2	2	2	2	3	3	4	3	2	2	2	1	1	2	3	2	3	3	1	0	1	1	1	0	4	2	24
18	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	4	5	3	2	2	2	2	1	5	2	24
19	2	2	2	2	2	2	3	3	3	3	2	2	3	2	2	1	3	5	10	9	4	3	6	5	1	10	3	24
20	7	9	12	13	14	13	13	14	13	10	8	7	6	7	7	7	6	6	5	4	3	3	2	2	2	14	8	24
21	2	2	2	2	2	2	3	3	3	3	3	2	2	2	2	2	2	3	4	4	4	9	5	7	2	9	3	24
22	11	12	11	9	7	5	3	3	4	3	3	3	2	2	1	2	2	2	2	2	2	2	1	1	1	12	4	24
23	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	1	1	2	1	24
24	1	1	1	1	1	1	2	2	2	1	1	1	1	1	1	0	0	0	0	0	0	1	1	1	0	2	1	24
25	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	1	1	0	24
26	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	1	1	2	2	1	2	1	1	2	1	24
27	3	4	5	5	6	7	8	7	7	5	4	2	2	1	1	1	2	2	1	1	1	1	2	2	1	8	3	24
28	3	3	4	4	4	5	5	4	3	3	4	3	3	3	2	2	2	1	1	1	1	1	1	1	1	5	3	24
29	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	1	2	1	24
30	3	2	2	3	3	3	2	2	2	2	2	1	1	1	2	2	2	2	3	2	4	5	21	15	1	21	4	24
31	2	2	3	2	3	4	3	3	4	5	5	5	5	5	4	3	3	3	2	3	3	2	3	3	2	5	3	24
HOURLY MAX	13	12	12	13	14	13	14	14	13	10	10	12	11	9	8	8	8	10	9	9	8	9	21	15				
HOURLY AVG	3	3	3	3	3	3	3	3	3	2	2	2	2	2	2	2	2	2	2	2	2	2	3	2				

STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

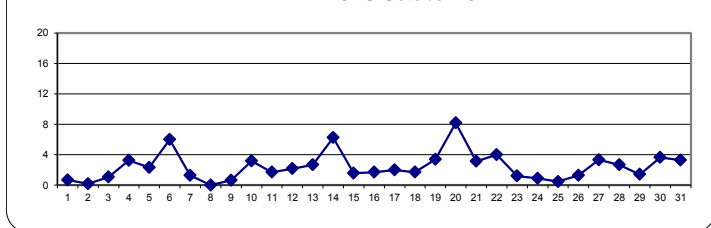
OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT: 1-HR 80 µg/m³ 24-HR 30 µg/m³

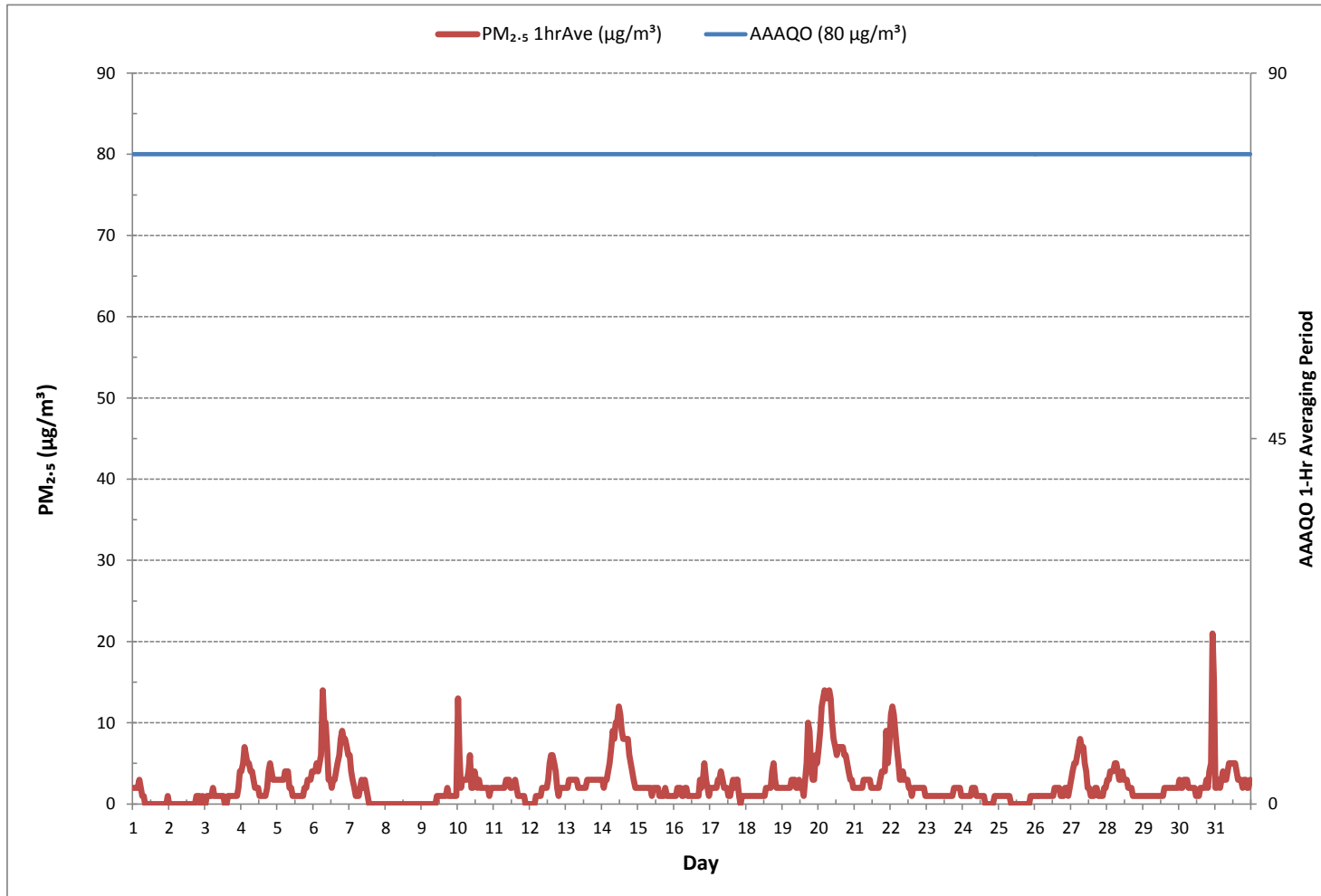
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0
NUMBER OF 24-HR EXCEEDANCES:	0
NUMBER OF NON-ZERO READINGS:	633
MINIMUM 1-HR AVERAGE:	0 µg/m ³ @ HOUR 8 ON DAY 1
MAXIMUM 1-HR AVERAGE:	21 µg/m ³ @ HOUR 22 ON DAY 30
MAXIMUM 24-HR AVERAGE:	8 µg/m ³ ON DAY 20
MONTHLY CALIBRATION TIME:	1 hrs
OPERATIONAL TIME:	744 hrs
AMSD OPERATION UPTIME:	100.0 %
STANDARD DEVIATION:	3
MONTHLY AVERAGE:	2 µg/m ³

24 HR AVERAGES October 2017



PARTICULATE MATTER < 2.5 MICRONS Hourly Averages (PM_{2.5} µg/m³)





Wind: LICA COLD LAKE SOUTH
 Poll.: LICA COLD LAKE SOUTH-PM2.5_2[ug/m3(L)]
 Monthly: 17/10
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

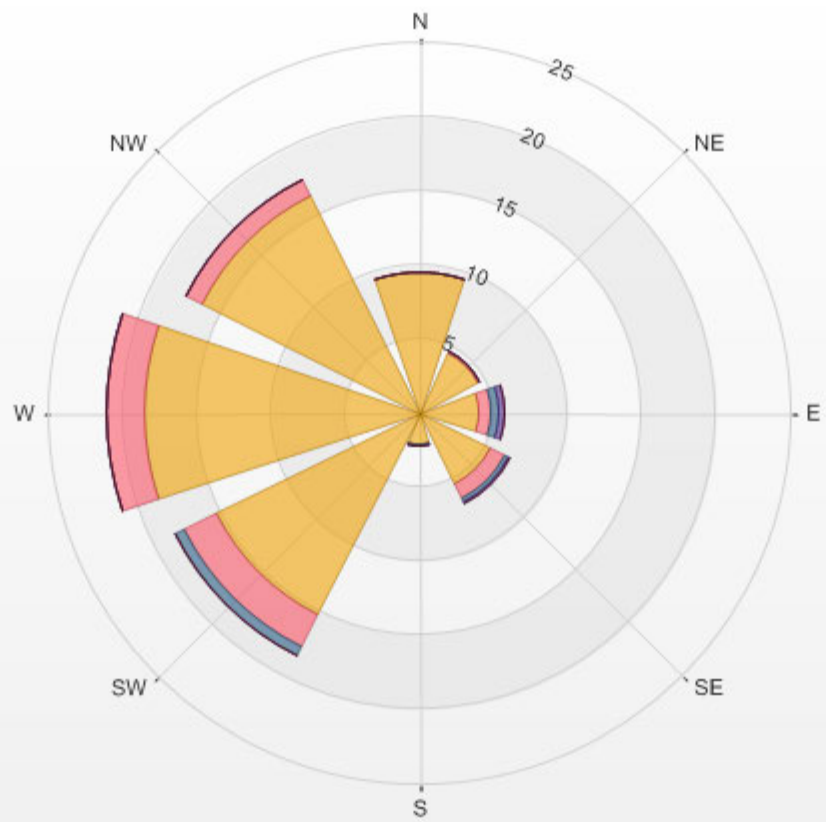
Calm: 13.74%

Calm Avg: 3.82 [ug/m3(L)]

Direction	0.0-4.4	4.4-8.8	8.8-13.2	13.2-17.6	17.6-22.0	>22.0	Total
N	9.5	0.0	0.0	0.0	0.0	0.0	9.5
NE	4.5	0.1	0.0	0.0	0.0	0.0	4.6
E	4.1	0.8	0.5	0.4	0.0	0.0	5.9
SE	5.4	1.1	0.3	0.1	0.0	0.0	6.9
S	2.2	0.0	0.1	0.0	0.0	0.0	2.3
SW	15.2	2.5	0.7	0.0	0.0	0.0	18.4
W	18.5	2.6	0.0	0.0	0.0	0.0	21.1
NW	16.3	1.2	0.0	0.0	0.0	0.0	17.6
Summary	75.8	8.3	1.6	0.6	0.0	0.0	86.3

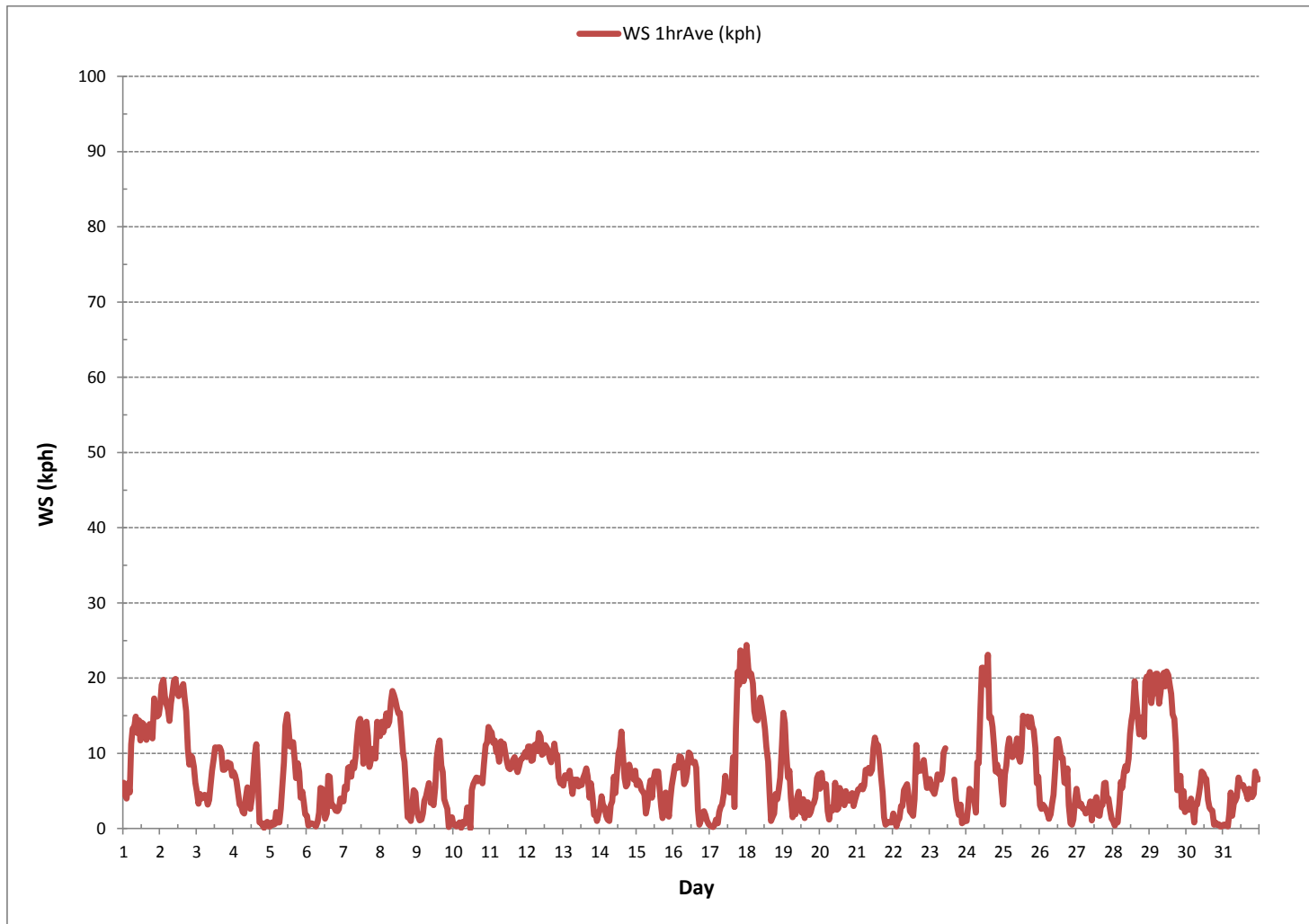
% Icon	Classes (ug/m3(L))	76	 0.0-4.4	8	 4.4-8.8	2	 8.8-13.2	1	 13.2-17.6	0	 17.6-22.0	0	 >22.0
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LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-PM2.5_2[ug/m3(L)] 2017/10/01 00:00 - 2017/10/31 23:00 Calm: 13.74% Calm Poll Avg: 3.82[ug/m3(L)]

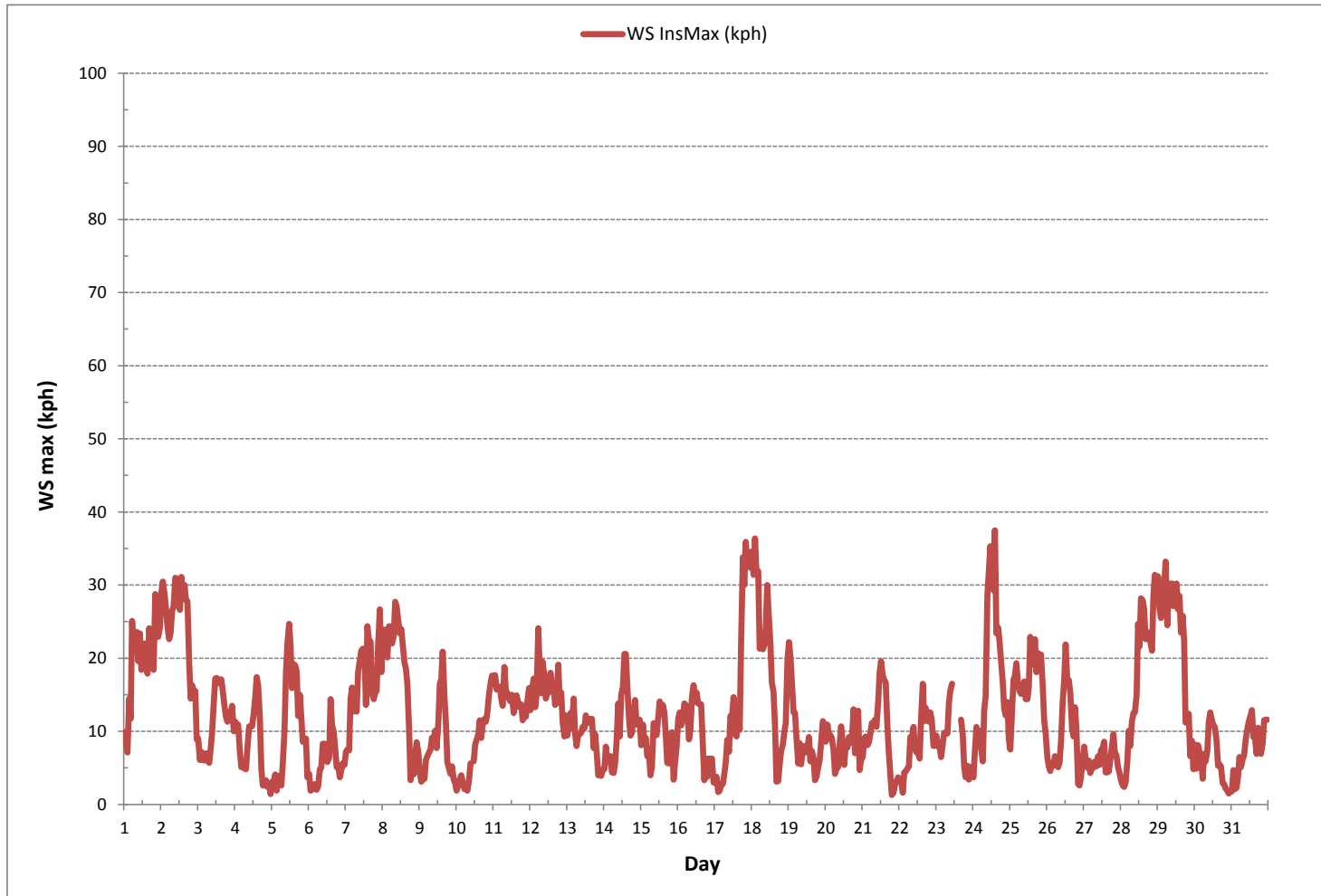


WIND SPEED

WIND SPEED Hourly Averages (WS kph)



WIND SPEED Instantaneous Maximum (WS kph)



Wind: LICA COLD LAKE SOUTH
 Monitor: WSP [kph]
 Monthly: 17/10
 Type: WindRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 13.67%

Direction	1.8-4.9	4.9-9.8	9.8-14.7	14.7-19.6	19.6-24.5	>24.5	Total
N	0.3	3.5	2.2	3.1	0.7	0.0	9.8
NE	0.3	2.3	2.0	0.1	0.0	0.0	4.7
E	2.4	2.7	0.7	0.0	0.0	0.0	5.8
SE	4.2	2.2	0.4	0.1	0.0	0.0	6.9
S	2.2	0.1	0.0	0.0	0.0	0.0	2.3
SW	7.6	8.3	2.3	0.1	0.0	0.0	18.3
W	7.0	9.7	2.8	1.0	0.5	0.0	21.1
NW	1.9	4.2	5.8	3.5	2.0	0.0	17.5
Summary	25.9	33.0	16.3	8.0	3.3	0.0	86.4

% Icon Classes (kph)

26  1.8-4.9

33  4.9-9.8

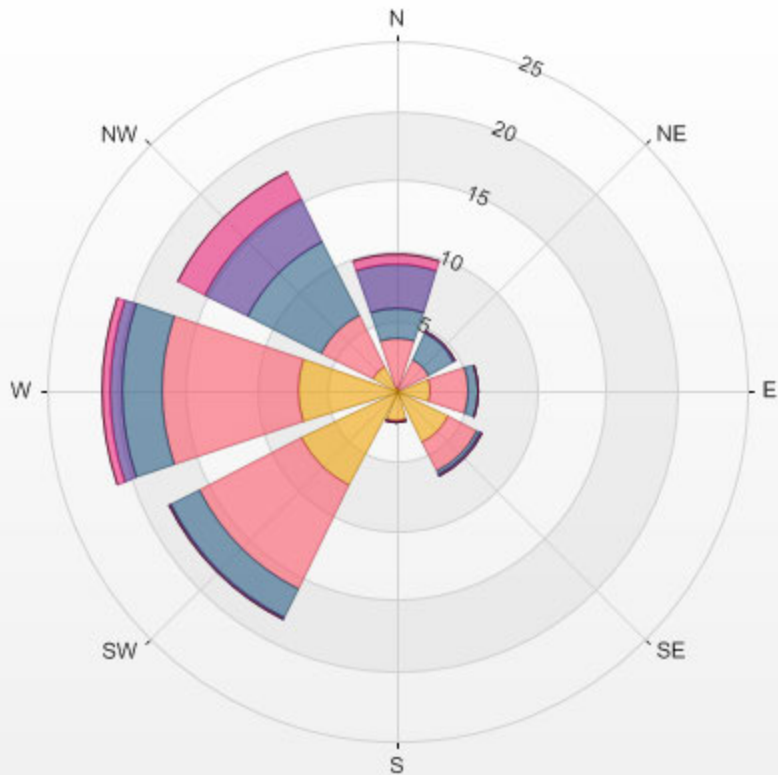
16  9.8-14.7

8  14.7-19.6

3  19.6-24.5

0  >24.5

LICA COLD LAKE SOUTH 2017/10/01 00:00 - 2017/10/31 23:00 Calm: 13.67% Calm Wind Avg Speed: 0.86(kph)



WIND DIRECTION



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Cold Lake Continuous Monitoring Station - October 2017

WIND DIRECTION Hourly Averages (WD)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	24-HOUR AVG	24-HR	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	QUADRANT	RDGS.	
DAY 1	WNW	W	W	WNW	WNW	NW	NW	NW	NNW	NNW	NNW	NW	NW	NNW	NW	NW	NNW	NNW	NNW	NNW	N	N	N	N	NNW	24	
2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	NNE	N	N	N	NNW	NNW	N	24	
3	NNW	W	WSW	WSW	W	WSW	WSW	W	WSW	WSW	SW	WSW	WSW	WSW	WSW	WSW	WSW	SW	WSW	SW	WSW	WSW	WSW	WSW	WSW	24	
4	WSW	WSW	WSW	WSW	WSW	WSW	WSW	W	WNW	NNW	NW	NNW	N	NNW	N	N	NNE	ENE	S	SSE	SW	SE	WSW	SSW	NW	24	
5	SW	WSW	NW	W	SE	ESE	S	SW	SW	SW	SW	SW	WSW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	24	
6	SW	SSW	ENE	SSW	SW	WSW	SE	NW	WSW	WSW	WSW	WSW	SSW	S	WSW	SSW	SW	SW	SW	SW	W	WSW	WSW	WSW	WSW	24	
7	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	W	WNW	W	WNW	W	WNW	NW	NW	WNW	W	W	WNW	WNW	NNW	NW	WNW	24		
8	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NNW	NW	WNW	WNW	WSW	SW	W	WSW	W	WSW	NW	24		
9	SW	SSW	SW	SE	SE	SE	SE	SE	S	SW	S	SW	S	SW	SW	WSW	W	W	WSW	SW	WSW	WSW	SSE	SW	WSW	24	
10	E	SE	SW	WSW	SSW	NW	SSE	ESE	W	WSW	W	NW	NE	NNE	NNE	NE	NE	NE	NE	E	ENE	ENE	ENE	ENE	NE	24	
11	ENE	ENE	NE	NE	NE	ENE	NE	NE	ENE	ENE	NE	NNE	NNE	N	N	N	N	N	N	NNW	N	N	N	NNE	24		
12	NNW	NNW	NNW	NNW	NW	NNW	NNW	NW	NNW	NNW	NNW	NNW	NNW	NW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	24	
13	WNW	NW	NW	NW	NW	NW	WNW	NW	NW	NW	WNW	WNW	WSW	WSW	W	WSW	SW	SW	SW	SW	SSW	SW	SW	SSW	W	24	
14	SW	SW	SW	S	S	SSE	SSE	SSE	SSW	SW	SSW	SW	SW	SW	WSW	WSW	WSW	SW	WSW	WSW	WSW	WSW	WSW	WSW	W	24	
15	W	W	W	WSW	WSW	WSW	SSW	SW	SW	SW	SSW	SW	SSW	SW	SSW	SW	SSW	SSW	S	SW	W	SW	SW	WSW	SW	24	
16	WSW	WSW	WSW	WSW	WSW	W	W	WSW	WSW	W	W	WNW	W	WSW	WSW	SW	SW	E	SSW	E	E	E	ENE	SE	WSW	24	
17	S	W	S	ESE	ESE	SE	SE	SE	ESE	SE	ESE	SE	SSE	SE	SE	S	W	WNW	WNW	WNW	WNW	WNW	WNW	WNW	W	24	
18	WNW	WNW	WNW	WNW	WNW	W	W	W	WNW	WNW	WNW	WNW	W	W	SSW	SE	SE	SE	ESE	ESE	ESE	ESE	ESE	ESE	W	24	
19	SE	SE	SE	SE	SE	SE	SE	SSE	SSE	SW	WSW	WSW	W	WSW	W	NE	NE	ENE	E	ESE	ESE	ENE	E	ESE	SE	24	
20	E	E	E	ESE	E	SE	NE	E	ESE	SE	SE	WSW	WNW	NNW	W	WNW	WNW	NW	NNW	NW	WNW	WNW	W	WNW	N	24	
21	NW	NW	NW	NW	WNW	W	W	W	WNW	W	WNW	W	WNW	WNW	WNW	WNW	WNW	W	WSW	SW	S	SE	SE	SSE	W	WNW	24
22	ENE	E	SSE	ENE	E	E	E	ENE	E	E	E	ESE	NW	WSW	WSW	SW	WSW	W	W	WSW	W	W	W	WSW	WSW	24	
23	W	W	W	W	W	WSW	WSW	WSW	WSW	W	W	C	C	C	C	C	W	W	SW	SW	SW	SW	SE	SSE	W	24	
24	S	S	SSW	SSW	SSW	SSW	SSW	SW	WSW	W	WNW	WNW	WNW	NW	NW	WNW	WNW	NW	NW	N	NNE	NNE	ENE	E	WNW	24	
25	E	E	E	E	E	E	E	E	ENE	ENE	ENE	NE	NE	NNE	NNE	N	N	NNW	NNW	N	N	N	N	NNW	NE	24	
26	NNW	WNW	W	WSW	WSW	SSW	SSW	SSE	S	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SSE	S	WSW	WSW	SW	24	
27	WSW	W	WSW	WSW	WSW	WSW	WSW	SW	WSW	SW	WSW	SW	WSW	WSW	S	SSW	SE	SE	SE	SE	SE	SE	SSE	SE	S	SSW	24
28	SSE	SW	S	SSE	WSW	WSW	W	W	W	W	W	WNW	WNW	WNW	NW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	NW	NW	WNW	24	
29	NW	NW	NW	NW	NW	NW	NNW	NW	NNW	NNW	NNW	NNW	N	N	N	NNW	NNW	N	N	NNW	NNW	N	NNW	NNW	WSW	NNW	24
30	W	WSW	WSW	SW	SW	S	SW	SSW	SW	SW	SW	SW	SW	SSW	S	SSE	SE	SSE	SW	SE	SSE	S	SW	SW	SW	24	
31	SSE	SSW	SE	S	SE	SE	S	SE	SE	SE	SE	SE	ESE	SE	ESE	E	E	E	E	E	E	E	E	E	ESE	24	

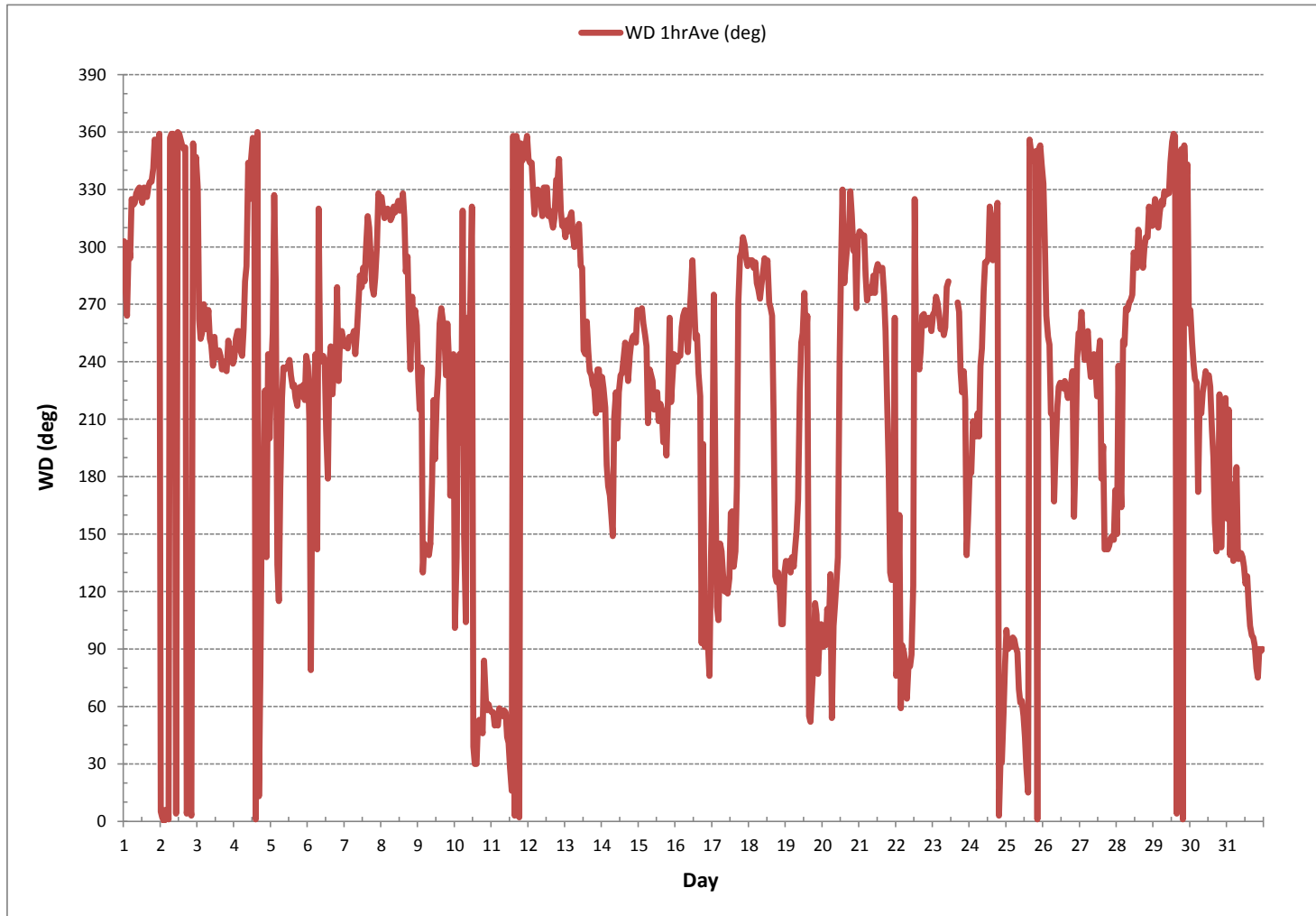
STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

LAST CALIBRATION:	October 23, 2017
DECLINATION :	MAGNETIC DECLINATION 19 DEGREE EAST

MONTHLY CALIBRATION TIME:	5 hrs	OPERATIONAL TIME:	744 hrs
STANDARD DEVIATION:	90	AMD OPERATION UPTIME:	100.0 %
		MONTHLY AVERAGE:	302 (WNW)

WIND DIRECTION Hourly Averages (WD)



STANDARD DEVIATION WIND DIRECTION



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Cold Lake Continuous Monitoring Station - October 2017

STANDARD DEVIATION WIND DIRECTION Hourly Averages (STDWD deg)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	
DAY																									
1	18	22	20	16	22	17	16	17	17	19	17	18	15	16	16	15	18	20	15	17	18	19	19	19	24
2	21	20	20	19	19	19	19	19	27	18	17	18	18	19	20	19	19	19	18	17	18	16	16	16	24
3	17	15	10	15	18	15	15	20	28	23	23	24	23	22	23	20	19	18	18	15	19	19	18	16	24
4	15	15	17	15	20	16	20	22	20	28	36	56	45	37	25	20	20	39	53	46	65	36	51	61	24
5	51	38	36	49	17	63	57	23	20	19	20	20	21	24	23	22	25	29	18	20	32	23	29	33	24
6	26	58	57	49	51	64	64	66	35	19	21	24	39	39	17	20	34	22	23	26	17	11	9	11	24
7	12	11	16	18	18	17	19	18	21	21	21	21	20	21	19	16	18	19	18	20	20	22	17	15	24
8	15	14	14	16	16	17	15	15	16	15	16	17	16	17	17	17	19	18	45	46	56	20	17	15	24
9	20	21	47	46	40	20	17	15	19	41	30	34	32	21	22	20	19	16	18	18	13	55	58	35	24
10	48	55	43	25	33	44	42	46	34	31	47	50	23	20	18	16	15	18	18	22	17	15	15	14	24
11	15	16	17	16	16	15	15	15	17	16	19	20	20	19	17	18	17	18	17	15	18	15	17	19	24
12	16	16	17	16	15	16	15	16	17	15	17	16	16	16	16	18	19	15	15	20	18	15	17	16	24
13	19	16	17	16	15	16	17	16	17	16	26	26	24	22	21	18	17	18	13	14	28	27	52	45	24
14	30	25	36	42	53	64	57	31	36	28	36	28	19	22	19	20	17	15	17	17	18	19	17	17	24
15	17	17	18	15	13	11	21	22	22	20	33	31	30	36	29	36	35	51	45	30	33	38	19	16	24
16	18	16	16	17	16	17	18	17	18	21	24	21	23	20	20	18	21	65	57	21	26	45	53	52	24
17	63	65	69	61	51	56	25	24	27	20	24	25	33	35	19	14	32	18	19	19	18	18	20	21	24
18	22	21	20	21	21	21	19	19	19	21	22	22	23	22	22	25	28	19	15	15	20	22	22	19	24
19	15	15	17	18	16	25	57	52	55	31	30	51	60	41	55	34	16	16	17	22	21	23	17	21	24
20	20	16	19	23	21	33	30	21	22	22	18	42	30	23	32	33	45	25	32	14	16	16	17	17	24
21	16	16	17	14	18	19	19	18	18	22	21	22	23	23	22	23	21	14	29	43	47	64	33	42	24
22	18	37	56	48	32	14	20	13	17	18	28	46	58	58	49	16	18	17	18	16	16	16	16	15	24
23	17	16	17	15	15	13	16	16	19	20	23	C	C	C	C	C	19	16	18	22	14	43	59	57	24
24	58	41	32	36	38	28	46	16	17	21	21	22	21	20	17	22	20	13	14	17	20	19	19	19	24
25	23	18	19	19	18	17	18	18	18	16	16	17	19	18	19	17	17	16	15	17	18	16	16	16	24
26	18	16	14	12	25	38	61	47	30	25	20	18	20	20	21	20	22	22	14	21	27	42	31	14	24
27	10	13	15	16	17	14	25	26	19	21	45	40	38	30	31	28	10	25	14	17	24	24	31	62	24
28	60	57	32	40	15	16	22	16	18	18	18	21	22	21	18	19	20	20	18	16	20	15	17	16	24
29	17	17	16	18	15	16	19	17	15	16	15	18	20	20	20	18	17	16	19	19	15	19	17	16	24
30	15	21	33	25	39	28	22	22	21	18	19	20	18	18	37	32	28	24	26	49	46	44	26	28	24
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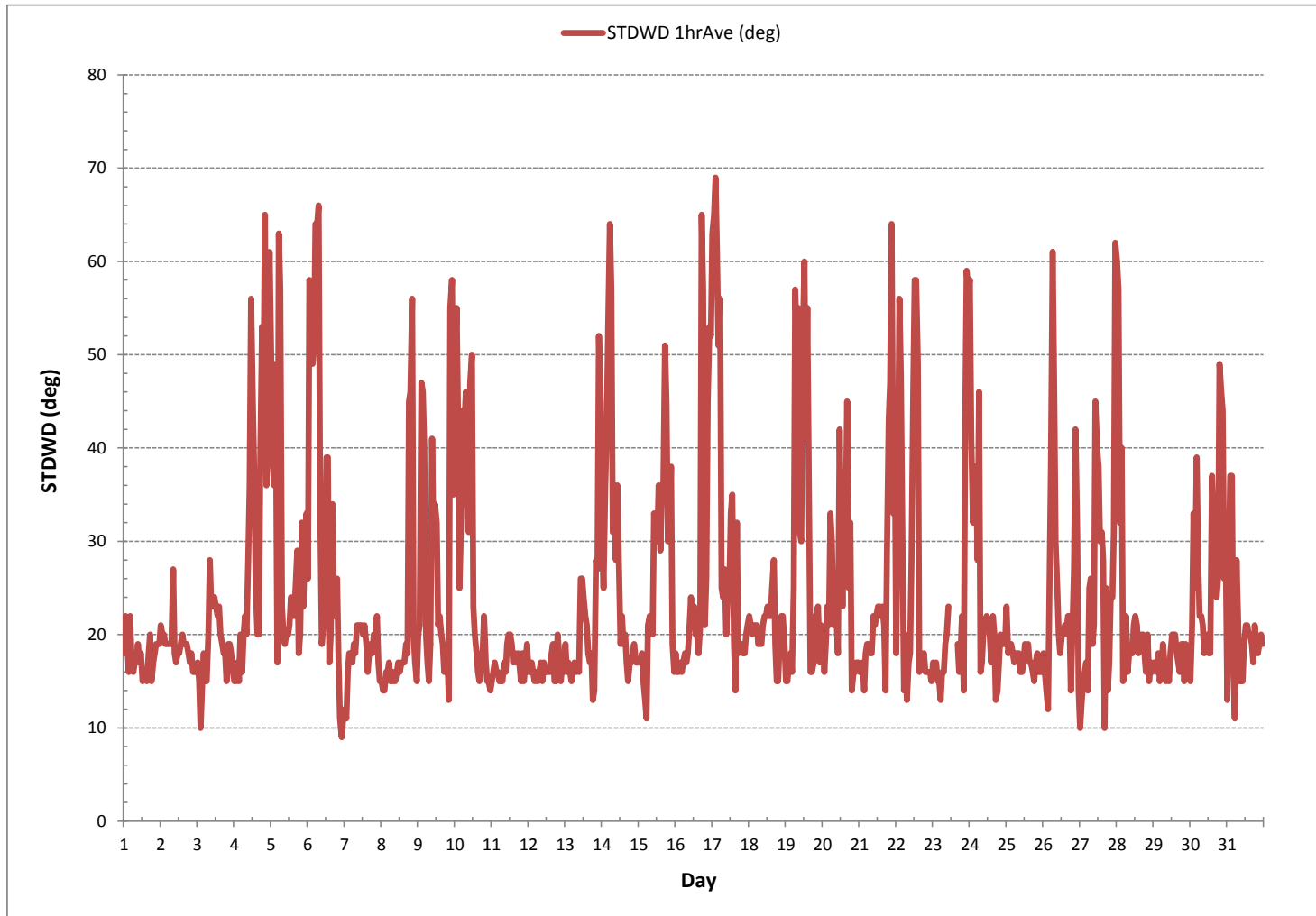
STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

LAST CALIBRATION: October 23, 2017

CALIBRATION TIME: 5 hrs OPERATIONAL TIME: 744 hrs

STANDARD DEVIATION WIND DIRECTION Hourly Averages (STDWD deg)



AMBIENT TEMPERATURE



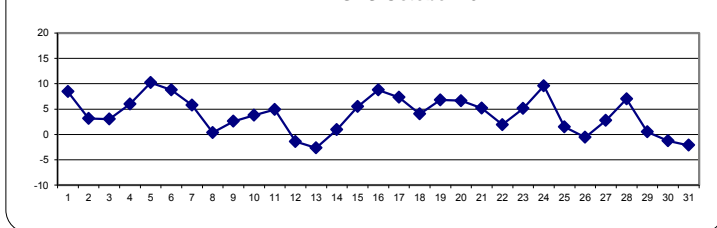
AMBIENT TEMPERATURE Hourly Averages (AmbTPX °C)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY																													
1	12.2	11.9	11.7	11.6	11.8	12.3	11.8	10.9	10.1	9.3	8.3	7.9	7.6	7.4	6.8	6.9	6.4	6.0	5.6	5.6	5.5	5.3	4.8	4.9	4.8	12.3	8.4	24	
2	5.0	4.7	4.3	3.7	2.9	2.5	2.2	2.4	2.6	2.8	3.0	3.4	3.5	4.2	4.8	4.9	4.6	4.1	3.0	2.3	2.0	1.3	0.5	0.2	0.2	5.0	3.1	24	
3	-0.6	-1.7	-2.1	-2.6	-2.9	-3.4	-3.8	-2.6	0.0	2.2	4.3	6.1	7.2	8.4	9.0	9.1	8.9	8.0	6.8	5.7	5.2	4.4	3.9	3.5	-3.8	9.1	3.0	24	
4	2.8	1.9	1.5	0.9	0.2	-0.2	-0.2	0.6	4.9	8.1	9.8	11.5	12.6	13.4	13.9	14.1	13.9	11.9	7.7	5.2	3.6	2.4	1.5	0.9	-0.2	14.1	6.0	24	
5	0.3	1.1	1.7	2.5	2.1	2.8	3.5	4.9	8.4	11.0	14.4	16.0	17.4	18.7	19.1	19.2	18.4	16.5	15.0	13.7	12.0	10.7	9.5	6.6	0.3	19.2	10.2	24	
6	4.9	3.5	2.8	2.2	1.5	1.0	1.0	3.0	6.4	10.5	14.1	16.3	16.7	16.9	15.8	14.8	14.9	12.9	11.4	10.5	8.9	6.9	6.1	6.9	1.0	16.9	8.7	24	
7	4.1	5.3	6.3	7.1	7.4	6.8	5.9	5.0	6.5	7.2	7.6	7.4	5.0	4.6	6.1	7.1	7.1	6.4	5.3	4.8	4.9	4.7	3.5	2.3	2.3	7.6	5.8	24	
8	1.6	0.2	0.6	0.3	-0.4	-0.5	-0.7	-0.5	0.1	0.4	0.7	1.0	1.0	1.1	1.2	1.6	1.4	0.3	0.0	-0.1	0.1	0.2	0.2	-1.2	-1.2	1.6	0.4	24	
9	-2.4	-3.4	-4.3	-4.5	-3.2	-2.5	-2.6	-2.1	-0.8	0.9	2.2	3.0	5.1	8.3	11.2	11.9	11.1	10.0	7.4	6.3	4.1	2.4	2.3	1.3	-4.5	11.9	2.6	24	
10	-0.3	-1.3	-2.0	-2.4	-2.8	-3.3	-3.4	-2.8	-0.8	3.0	6.0	7.8	7.8	7.5	7.8	8.4	8.2	8.0	7.7	7.8	7.6	7.5	7.3	6.9	-3.4	8.4	3.8	24	
11	6.4	6.2	5.8	5.8	5.7	5.8	5.6	5.4	5.9	6.2	6.4	6.7	6.7	6.4	6.1	5.3	4.6	4.1	3.4	2.6	2.0	1.8	1.4	1.1	1.1	6.7	4.9	24	
12	0.7	0.7	0.6	0.1	-0.7	-1.3	-1.7	-1.7	-1.8	-1.9	-1.7	-1.5	-1.4	-1.5	-1.5	-1.3	-1.6	-1.9	-2.1	-2.3	-2.4	-2.5	-2.5	-2.6	-2.6	0.7	-1.4	24	
13	-2.8	-2.9	-3.0	-2.9	-2.9	-2.8	-2.7	-2.6	-2.3	-1.9	-1.3	-0.9	-0.9	-1.0	-1.2	-1.2	-1.6	-2.5	-3.4	-4.8	-5.7	-6.4	-5.0	-6.4	-0.9	-2.7	24		
14	-4.3	-3.3	-3.1	-3.1	-3.1	-2.7	-2.9	-2.5	-0.6	0.3	0.7	1.7	2.2	4.0	5.4	5.2	5.1	4.4	4.0	4.1	3.7	3.0	2.1	2.1	-4.3	5.4	0.9	24	
15	1.5	1.3	1.8	1.3	0.3	-0.5	-1.7	-1.4	1.4	3.2	4.8	7.0	9.0	10.5	11.1	11.6	11.4	10.5	10.1	10.5	8.4	6.0	6.7	7.2	-1.7	11.6	5.5	24	
16	7.6	7.4	6.9	6.4	6.7	6.8	6.4	5.7	7.0	9.4	11.0	11.7	12.2	12.1	12.5	11.9	11.4	10.2	9.8	9.2	7.5	7.8	7.4	5.7	5.7	12.5	8.8	24	
17	3.1	1.3	0.3	-0.3	-0.5	0.9	2.4	3.0	5.9	8.0	11.1	14.1	17.0	16.8	16.2	15.1	14.2	11.8	7.4	6.4	6.4	5.6	5.1	4.7	-0.5	17.0	7.3	24	
18	4.2	3.6	3.1	2.8	2.8	2.3	2.2	2.0	3.0	4.3	5.5	6.4	7.1	7.2	7.3	6.7	5.5	3.1	1.7	2.8	3.3	3.4	3.7	3.3	1.7	7.3	4.1	24	
19	3.3	3.0	2.5	2.3	2.5	2.3	0.7	0.4	2.7	4.8	7.0	9.6	11.4	13.1	15.3	13.9	10.7	8.2	7.7	9.0	9.1	8.3	7.9	7.4	0.4	15.3	6.8	24	
20	7.2	7.0	7.0	6.7	6.1	5.0	3.2	3.6	4.4	5.8	6.8	7.8	7.9	8.3	8.7	8.7	8.5	8.2	7.8	7.4	6.7	5.7	5.4	5.5	3.2	8.7	6.6	24	
21	5.9	6.1	6.3	5.9	5.7	5.2	4.4	4.0	4.0	5.0	7.3	9.5	10.2	10.6	10.9	10.8	9.4	6.8	3.3	0.8	-0.8	-1.6	-2.4	-2.9	-2.9	10.9	5.2	24	
22	-3.2	-3.6	-4.0	-4.4	-4.6	-3.2	-1.3	-0.8	0.9	2.2	3.4	5.0	6.9	8.3	9.6	6.6	4.0	3.9	4.7	4.1	3.5	2.8	2.6	2.5	-4.6	9.6	1.9	24	
23	3.3	3.4	3.9	3.5	3.2	2.9	2.6	2.4	3.9	6.1	8.1	9.3	10.4	10.9	11.1	10.3	9.5	7.8	4.0	1.6	0.8	-0.4	0.5	3.1	-0.4	11.1	5.1	24	
24	4.0	5.1	6.2	6.0	5.8	5.5	4.0	7.1	10.2	15.0	16.7	16.5	16.3	15.2	14.5	13.6	12.7	11.6	10.6	8.5	7.0	6.2	5.7	5.3	4.0	16.7	9.6	24	
25	5.0	4.5	4.0	3.4	2.0	1.1	0.9	0.6	0.5	0.8	0.9	0.8	1.3	1.5	1.4	1.7	1.7	1.3	1.2	1.2	0.9	0.3	-0.4	-0.9	-0.9	5.0	1.5	24	
26	-1.7	-2.7	-3.8	-4.1	-4.6	-3.5	-2.4	-2.1	-1.4	-0.4	0.4	1.2	1.7	2.1	2.7	3.0	2.9	2.7	2.1	1.1	-1.0	-2.0	-2.4	-1.1	-4.6	3.0	-0.6	24	
27	-0.4	0.0	-0.1	-0.4	-1.6	-2.1	-1.9	-1.9	-0.4	0.9	3.0	4.7	6.4	7.2	6.9	7.1	6.1	5.4	5.4	5.5	4.9	4.5	3.9	3.4	-2.1	7.2	2.8	24	
28	2.8	0.9	-0.2	-0.6	-1.0	3.0	2.3	4.9	6.9	9.6	12.0	14.0	14.6	13.9	12.8	11.8	10.4	9.2	8.5	8.0	7.2	6.7	5.2	4.4	-1.0	14.6	7.0	24	
29	4.6	3.8	3.2	3.5	3.0	2.9	2.4	0.1	0.8	1.2	0.8	1.0	1.1	0.9	1.1	0.9	0.0	-1.0	-1.9	-2.5	-2.8	-3.4	-3.6	-4.6	-4.6	4.6	0.5	24	
30	-4.8	-3.5	-3.0	-2.9	-2.6	-3.0	-2.7	-3.1	-2.3	-1.3	0.2	1.5	2.3	2.6	2.9	2.6	2.0	1.0	-0.2	-1.3	-2.5	-3.4	-4.1	-4.5	-4.8	2.9	-1.3	24	
31	-4.5	-4.1	-3.5	-3.1	-2.8	-2.6	-2.6	-2.7	-2.5	-2.2	-2.1	-1.8	-1.4	-1.2	-1.1	-1.2	-1.3	-1.3	-1.3	-1.4	-1.7	-1.9	-2.1	-2.1	-4.5	-1.1	-2.2	24	
HOURLY MAX	12.2	11.9	11.7	11.6	11.8	12.3	11.8	10.9	10.2	15.0	16.7	16.5	17.4	18.7	19.1	19.2	18.4	16.5	15.0	13.7	12.0	10.7	9.5	7.4					
HOURLY AVG	2.1	1.8	1.7	1.4	1.2	1.2	1.0	1.3	2.7	4.2	5.5	6.6	7.3	7.7	8.0	7.8	7.1	6.1	5.0	4.3	3.5	2.8	2.4	2.1					

STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

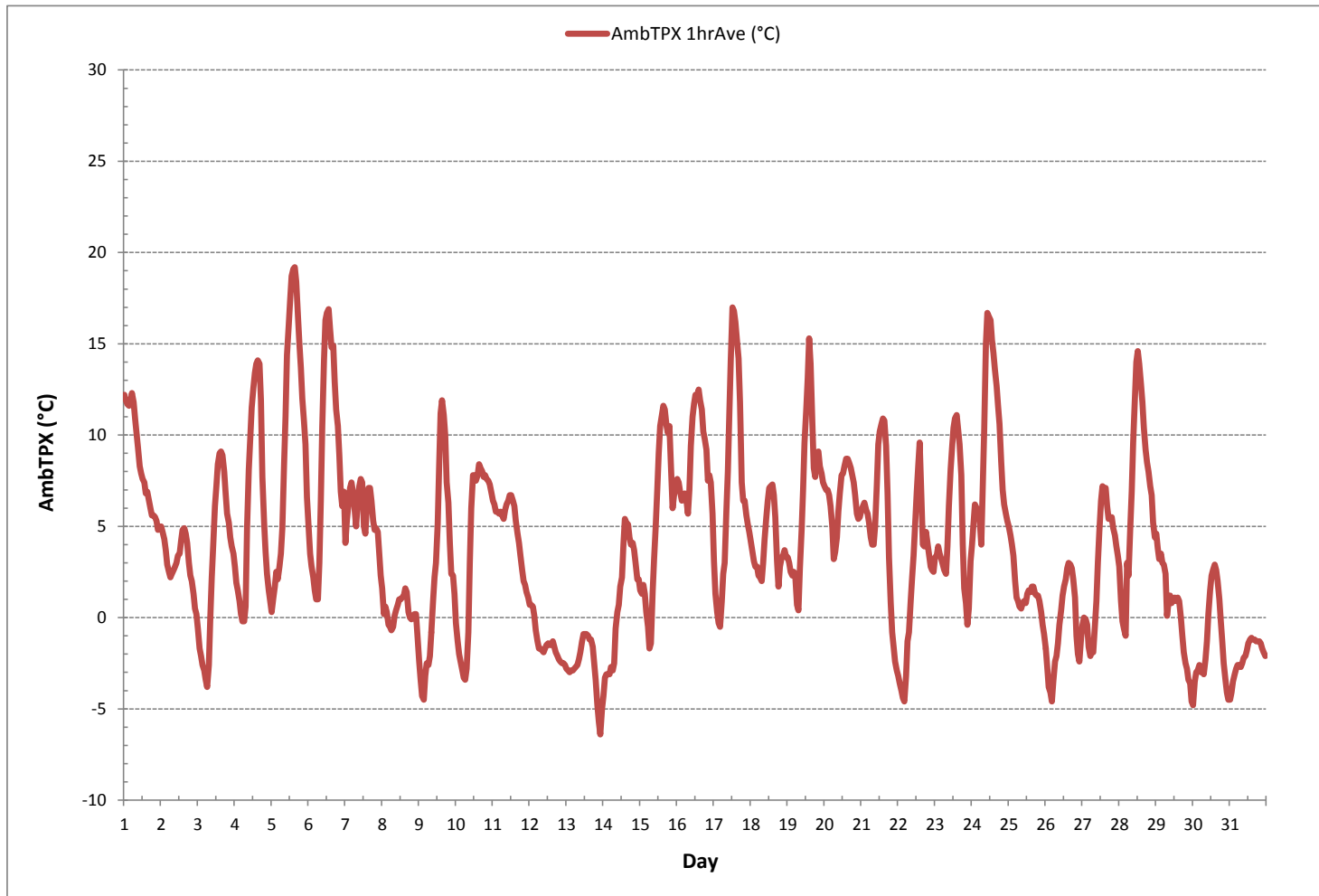
24 HR AVERAGES October 2017



MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	-6.4 °C	@ HOUR	22	ON DAY	13
MAXIMUM 1-HR AVERAGE:	19.2 °C	@ HOUR	15	ON DAY	5
MAXIMUM 24-HR AVERAGE:	10.2 °C			ON DAY	5
OPERATIONAL TIME:				744	hrs
AMD OPERATION UPTIME:				100.0	%
STANDARD DEVIATION:	5.0	MONTHLY AVERAGE:		3.9	°C

AMBIENT TEMPERATURE Hourly Averages (AmbTPX °C)



RELATIVE HUMIDITY



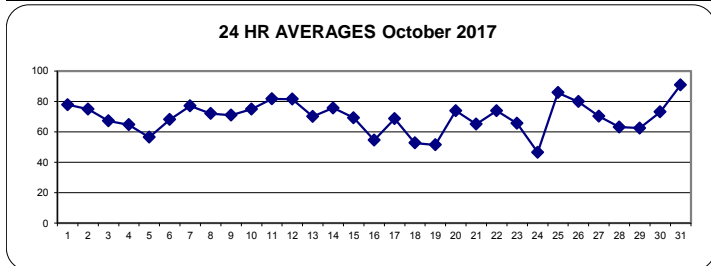
RELATIVE HUMIDITY Hourly Averages (RH %)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.	
DAY																												
1	61	63	67	70	71	69	70	72	70	71	75	80	80	84	89	84	85	86	90	91	85	84	86	84	61	91	78	24
2	80	80	79	80	84	85	88	86	82	79	75	73	72	69	68	65	65	63	67	69	68	70	75	77	63	88	75	24
3	81	86	88	88	89	90	91	88	80	75	67	57	51	48	46	45	45	48	52	57	57	57	60	65	45	91	67	24
4	70	75	77	80	82	84	82	81	65	51	47	44	42	38	37	37	39	49	65	74	78	82	85	88	37	88	65	24
5	88	89	88	87	87	86	85	76	58	50	38	34	31	28	28	28	30	34	38	42	47	54	59	71	28	89	57	24
6	78	83	83	85	88	91	89	89	79	60	48	39	38	39	41	49	50	58	63	68	74	80	82	79	38	91	68	24
7	87	76	70	66	66	76	70	70	62	59	59	64	86	92	91	79	77	78	87	87	87	89	87	82	59	92	77	24
8	81	94	83	81	82	74	77	73	69	67	65	64	65	65	62	58	64	69	74	77	76	72	66	70	58	94	72	24
9	76	82	83	84	79	77	77	77	73	70	69	79	74	63	52	46	48	47	59	65	74	81	83	86	46	86	71	24
10	89	90	91	92	91	92	91	90	90	81	65	57	58	64	66	61	66	64	73	67	64	62	66	69	57	92	75	24
11	70	73	77	77	77	75	79	82	80	78	77	76	76	77	80	84	86	87	89	94	95	92	91	90	70	95	82	24
12	92	88	84	86	93	94	94	93	88	82	80	79	77	78	77	74	75	76	74	75	72	74	76	75	72	94	82	24
13	75	75	72	68	67	67	68	70	69	66	62	60	61	62	63	65	65	67	70	73	81	83	87	84	60	87	70	24
14	82	82	81	81	81	81	84	88	82	75	74	71	71	64	59	62	63	66	69	69	75	82	87	87	59	88	76	24
15	88	90	88	88	91	92	93	95	88	81	76	64	53	48	45	45	45	48	49	47	56	66	63	61	45	95	69	24
16	60	60	62	63	61	60	62	65	62	55	48	43	39	37	36	41	43	49	51	58	64	58	61	70	36	70	55	24
17	79	84	86	86	86	85	79	73	63	58	50	45	37	38	41	45	47	66	91	89	83	82	80	75	37	91	69	24
18	67	65	64	64	62	66	66	69	65	55	47	43	34	37	34	34	42	51	58	49	48	48	48	49	34	69	53	24
19	50	50	53	53	51	53	61	63	57	52	49	43	40	37	33	38	54	64	62	51	51	54	56	59	33	64	51	24
20	61	64	66	68	71	76	83	82	81	77	73	70	70	69	67	69	71	69	69	69	77	90	93	88	61	93	74	24
21	81	76	69	68	66	68	72	73	74	70	61	50	43	40	40	39	44	52	66	75	81	82	86	87	39	87	65	24
22	87	87	88	89	88	87	83	81	76	73	70	63	55	49	45	58	66	65	63	70	77	82	84	85	45	89	74	24
23	84	83	80	81	80	79	78	77	70	63	57	50	46	43	42	43	45	49	62	70	72	77	75	66	42	84	66	24
24	63	57	49	51	52	53	59	53	48	41	37	37	34	41	33	35	36	31	33	40	54	58	60	62	31	63	47	24
25	62	65	68	72	84	92	94	95	96	95	95	96	96	93	93	90	87	87	86	84	83	81	82	81	62	96	86	24
26	85	89	92	92	92	90	90	88	83	77	71	69	68	67	65	66	65	66	70	81	86	89	83	65	92	80	24	
27	81	80	81	82	87	89	90	89	84	81	74	66	58	52	52	50	56	59	58	58	60	63	66	70	50	90	70	24
28	74	81	85	87	88	83	85	79	72	65	58	46	39	39	40	43	47	50	52	51	54	61	69	68	39	88	63	24
29	58	58	60	54	59	57	62	94	73	67	75	64	58	56	51	49	50	53	58	62	64	69	70	77	49	94	62	24
30	79	78	77	77	75	78	77	78	74	70	66	62	60	59	58	60	63	67	74	78	82	85	88	90	58	90	73	24
31	90	88	88	87	86	86	86	86	86	89	92	92	92	92	93	94	95	95	95	95	95	94	93	91	86	95	91	24
HOURLY MAX	92	94	92	92	93	94	94	95	96	95	95	96	96	93	93	94	95	95	95	95	95	94	93	91				
HOURLY AVG	76	77	77	77	78	79	80	80	74	69	65	61	58	57	56	56	59	62	67	69	71	74	76	76				

STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

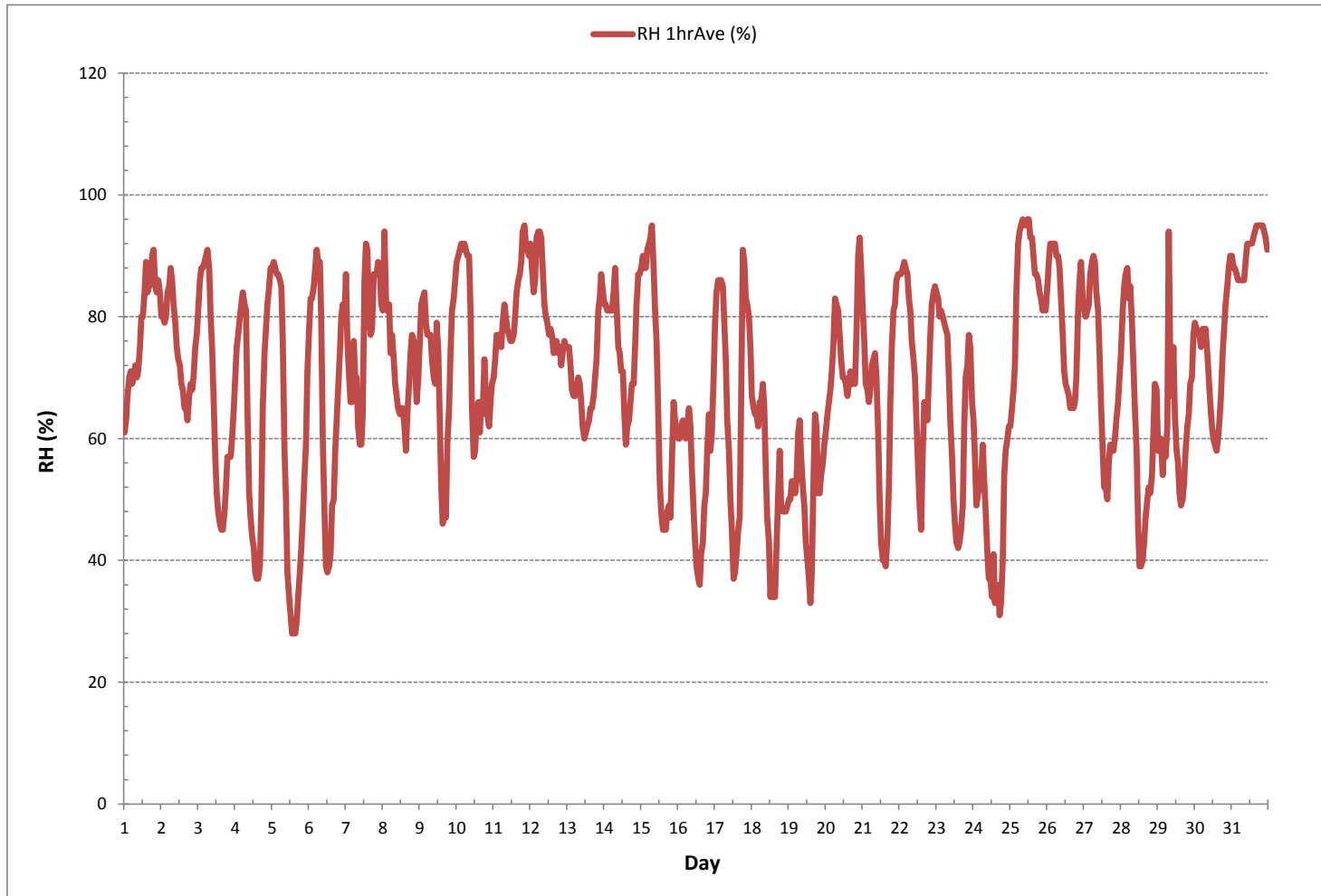
24 HR AVERAGES October 2017



MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	28	%	@ HOUR	13	ON DAY	5
MAXIMUM 1-HR AVERAGE:	96	%	@ HOUR	8	ON DAY	25
MAXIMUM 24-HR AVERAGE:	91	%			ON DAY	31
OPERATIONAL TIME:						744 hrs
AMD OPERATION UPTIME:						100.0 %
STANDARD DEVIATION:	16		MONTHLY AVERAGE:			70 %

RELATIVE HUMIDITY Hourly Averages (RH %)



APPENDIX II
EQUIPMENT CALIBRATION RESULTS

SULPHUR DIOXIDE



Thermo 43i Sulphur Dioxide Analyzer Calibration

Date:	October 10, 2017	Barometer/B.P./units:	F.S. 05544 expires December 5, 2018	940	millibars
Company/Airshed:	LICA	Thermometer/Station Temp:	F.S. 170286131 expires April 19, 2019	22	°C
Location/Station Name:	Cold Lake South	Weather Conditions:	A few clouds		
Parameter:	Sulphur Dioxide	Calibration Purpose:	routine monthly		
Start Time 24 hr. (mst):	10:08	Performed By/Reviewer:	Alex Yakupov	Tom Bourque	
End Time 24 hr. (mst):	14:21	Cal Gas Expiry Date:	July 18, 2019		
Calibration Method:	Gas Dilution	Converter Model & s/n (if applicable):	n/a		

ID# or Serial Number:	80652842	Range ppb:	500
Last Calibration Date:	September 12, 2017	As Found C.F.:	1.001
Previous C.F.:	0.999	New C.F.:	1.001

Calibration Standards: Low Flow Meter ID/Expiry Date: Defender Low 152020 expires November 21, 2017 High Flow Meter ID/Expiry Date: Defender High 148943 expires November 21, 2017 Calibrator ID/Expiry Date: API id# 627 expires January 27, 2018 Cal Gas Cylinder I.D. #: LL 104222 Cal Gas Conc. (ppm): 50.6	Standard Calibration Points for Ranges <table border="1"> <tr><th>Point</th><th>ppb</th></tr> <tr><td>High</td><td>380</td></tr> <tr><td>Mid</td><td>180</td></tr> <tr><td>Low</td><td>90</td></tr> </table>	Point	ppb	High	380	Mid	180	Low	90
Point	ppb								
High	380								
Mid	180								
Low	90								

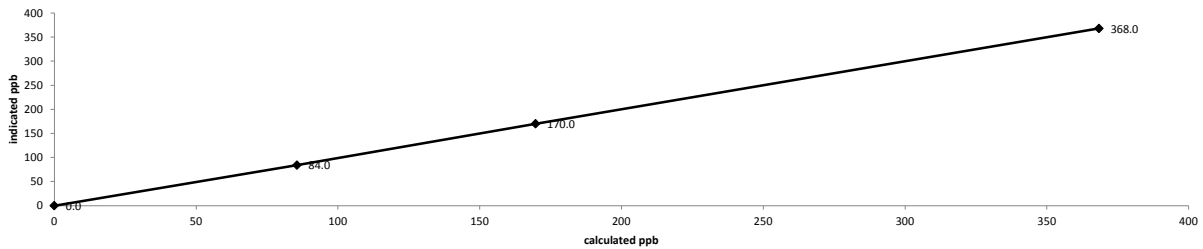
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Point	Calibrator Flow Rates (cc/min)			Total	Calculated Concentration (ppb):	Indicated Concentration (ppb):	Correction Factors (C.F.):
	Diluent	Cal Gas					
as found zero	5174	0.00		5174	0.0	0.0	n/a
as found high	5268	38.64		5307	368.4	368.0	1.001
adjusted zero	5174	0.00		5174	0.0	0.0	n/a
adjusted high	5268	38.64		5307	368.4	368.0	1.001
mid	5289	17.80		5307	169.7	170.0	0.998
low	5289	8.96		5298	85.6	84.0	1.019
calibrator zero	5174	0.00		5174	0.0	0.0	n/a
Average C.F. =							1.006

Linear Regression/Calibration Results:

Correlation Coefficient =	1.000	LIMITS	> or = 0.995
Slope =	1.000		0.95-1.05
b (Intercept as % of full scale) =	0.10%		± 3% F.S.
% change in C.F. from last cal =	-0.21%		± 10%

Thermo 43i Sulphur Dioxide Analyzer Calibration

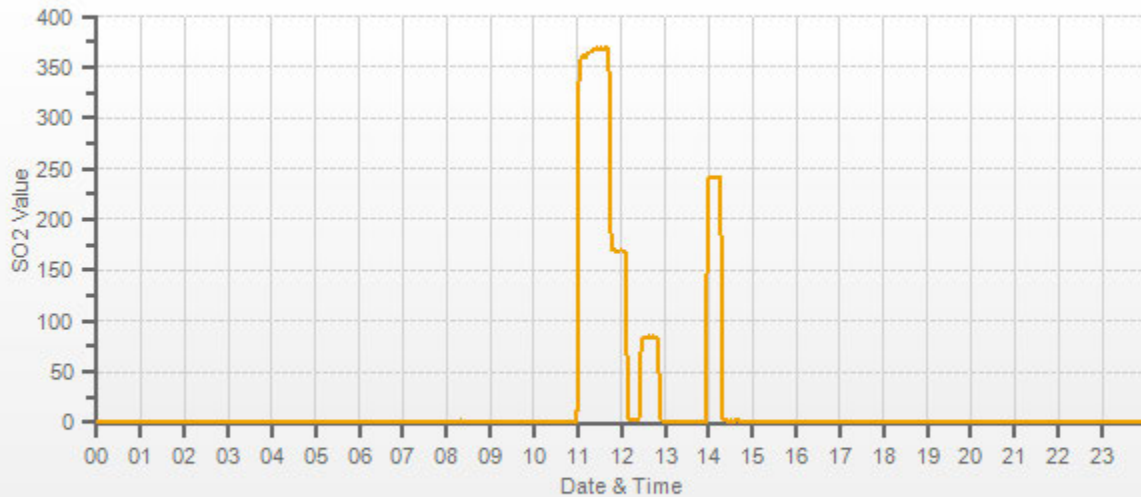


As found:		As left:	
Bkg:	7.9	Bkg:	7.9
Coef:	0.917	Coef:	0.917
Pmt:	-623.8	Pmt:	-624.2
Flash:	769	Flash:	769
Internal:	29.6	Internal:	30.8
Chamber:	44.9	Chamber:	45.2
Perm Oven Gas:	35.01	Perm Oven Gas:	35.01
Perm Oven Heater:	34.24	Perm Oven Heater:	34.25
Pressure:	679.2	Pressure:	678.9
Sample Flow:	0.475	Sample Flow:	0.475
Lamp Intensity:	96	Lamp Intensity:	96
Converter:	n/a	Converter:	n/a
Converter Set:	n/a	Converter Set:	n/a
Averaging Time:	120	Averaging Time:	120
Expected Value:	242.0	Expected Value:	241.0

Comments:

The analyzer sample inlet filter was changed.
 The analyzer cooling fan filter(s) were cleaned.
 The manifold blower was found to be working normally.
 No zero adjustment was required/made.
 No High Point SO2 adjustment was required/made.
 Flow measurement after mid-point.

SO2[ppb] Station: LICA COLD LAKE SOUTH Daily: 17/10/10 Type: AVG 1 Min. [1 Min.]



— SO2[ppb]

TOTAL REDUCED SULPHUR



Thermo 450i Total Reduced Sulphur Analyzer Calibration

Date: <u>October 10, 2017</u>	Barometer/B.P./units: <u>F.S. 05544 expires December 5, 2018</u>	<u>940</u>	millibars	
Company/Airshed: <u>LICA</u>	Thermometer/Station Temp: <u>F.S. 170286131 expires April 19, 2019</u>	<u>22</u>	°C	
Location/Station Name: <u>Cold Lake South</u>	Weather Conditions: <u>A few clouds</u>			
Parameter: <u>Total Reduced Sulphur</u>	Calibration Purpose: <u>routine monthly</u>			
Start Time 24 hr. (mst): <u>10:08</u>	Performed By/Reviewer: <u>Alex Yakupov</u>	<u>Tom Bourque</u>		
End Time 24 hr. (mst): <u>14:21</u>	Cal Gas Expiry Date: <u>June 14, 2019</u>			
Calibration Method: <u>Gas Dilution</u>	Converter Model & s/n (if applicable): <u>CDNova Model CDN-101 / #501</u>			

Analyzer ID# or Serial Number: <u>812728560</u>	Range ppb: <u>100</u>		
Last Calibration Date: <u>September 12, 2017</u>	As Found C.F.: <u>1.009</u>		
Previous C.F.: <u>1.002</u>	New C.F.: <u>1.000</u>		

Calibration Standards: Low Flow Meter ID/Expiry Date: <u>Defender Low 152020 expires November 21, 2017</u> High Flow Meter ID/Expiry Date: <u>Defender High 148943 expires November 21, 2017</u> Calibrator ID/Expiry Date: <u>Sabio id# 11900613 expires March 16, 2018</u> Cal Gas Cylinder I.D. #: <u>EY 0000654</u> Cal Gas Conc. (ppm): <u>10.2</u>	Standard Calibration Points for Ranges <table border="1" style="margin: auto;"> <tr><th>Point</th><th>ppb</th></tr> <tr><td>High</td><td>78</td></tr> <tr><td>Mid</td><td>38</td></tr> <tr><td>Low</td><td>19</td></tr> </table>	Point	ppb	High	78	Mid	38	Low	19
Point	ppb								
High	78								
Mid	38								
Low	19								

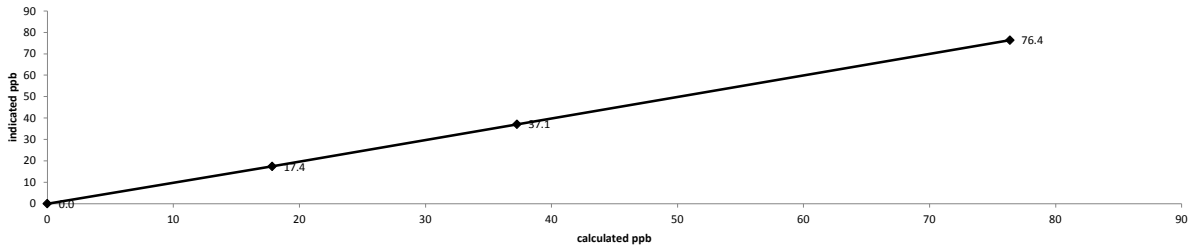
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Point	Calibrator Flow Rates (cc/min)			Total	Calculated Concentration (ppb):	Indicated Concentration (ppb):	Correction Factors (C.F.):
	Diluent	Cal Gas					
as found zero	7913	0.00		7913	0.0	0.0	n/a
as found high	7849	59.22		7908	76.4	75.7	1.009
adjusted zero	7913	0.00		7913	0.0	0.0	n/a
adjusted high	7849	59.22		7908	76.4	76.4	1.000
mid	7881	28.90		7910	37.3	37.1	1.004
low	7911	13.86		7925	17.8	17.4	1.025
calibrator zero	7913	0.00		7913	0.0	0.0	n/a
Average C.F. =							1.010

Linear Regression/Calibration Results:

Correlation Coefficient =	<u>1.000</u>	LIMITS	<u>> or = 0.995</u>
Slope =	<u>0.998</u>		<u>0.95-1.05</u>
b (Intercept as % of full scale) =	<u>0.22%</u>		<u>± 3% F.S.</u>
% change in C.F. from last cal =	<u>-0.70%</u>		<u>± 10%</u>

Thermo 450i Total Reduced Sulphur Analyzer Calibration



As found: Bkg: <u>14.2</u> Coef: <u>0.891</u> Pmt: <u>-650.8</u> Flash: <u>739</u> Internal: <u>32.7</u> Chamber: <u>45.2</u> Converter Temp: <u>825</u> Converter Set: <u>825</u> Perm Oven Gas: <u>45.00</u> Perm Oven Htr: <u>44.37</u> Pressure: <u>631.9</u> Sample Flow: <u>0.489</u> Lamp Intensity: <u>93</u> Averaging Time: <u>120</u> Expected Value: <u>38.2</u>	As left: Bkg: <u>14.3</u> Coef: <u>0.900</u> Pmt: <u>-650.8</u> Flash: <u>740</u> Internal: <u>33.5</u> Chamber: <u>45.1</u> Converter Temp: <u>825</u> Converter Set: <u>825</u> Perm Oven Gas: <u>45.01</u> Perm Oven Htr: <u>44.37</u> Pressure: <u>633.4</u> Sample Flow: <u>0.490</u> Lamp Intensity: <u>92</u> Averaging Time: <u>120</u> Expected Value: <u>38.2</u>
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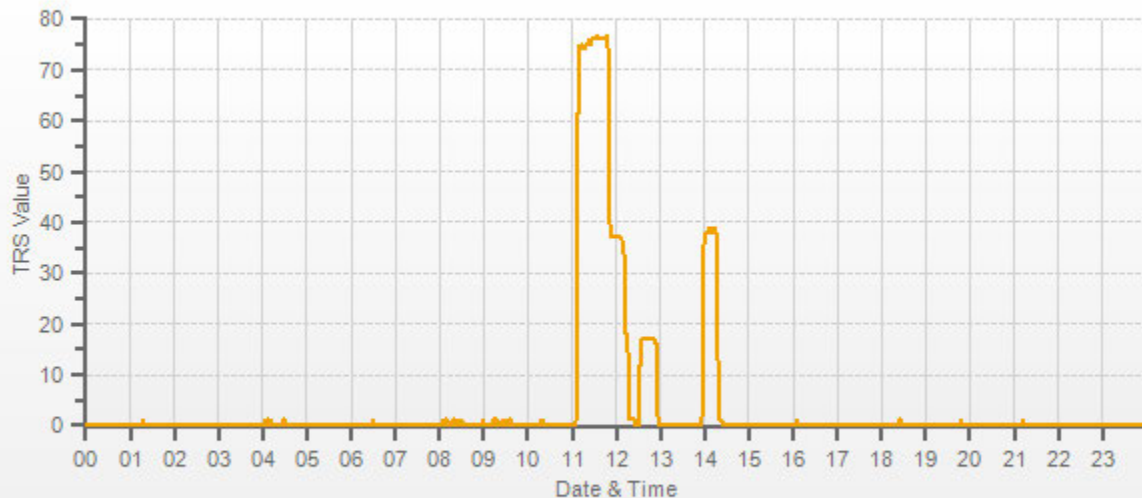
Comments:

The analyzer sample inlet filter was changed.
 The manifold blower was found to be working normally.
 No zero adjustment was required/made.

The analyzer cooling fan filter(s) were cleaned.

Flow measurement after mid-point.

TRS[ppb] Station: LICA COLD LAKE SOUTH Daily: 17/10/10 Type: AVG 1 Min. [1 Min.]



— TRS[ppb]

TOTAL HYDROCARBON



Thermo 51C Total Hydrocarbon Analyzer Calibration

Date:	October 11, 2017	Barometer/B.P./units:	F.S. 05544 expires December 5, 2018	933	millibars
Company/Airshed:	LICA	Thermometer/Station Temp:	F.S. 170286131 expires April 19, 2019	23	°C
Location/Station Name:	Cold Lake South	Weather Conditions:	A few clouds		
Parameter:	Total Hydrocarbon	Calibration Purpose:	routine monthly		
Start/End Time 24 hr. (mst):	9:15 / 13:12	Performed By/Reviewer:	Alex Yakupov	Tom Bourque	
Calibration Method:	Gas Dilution	Cal Gas Expiry Date:	November 25, 2023		

Analyzer:	ID# or Serial Number:	812728560	Range ppm:	50
	Last Calibration Date:	September 13, 2017	As Found C.F.:	0.934
	Previous Cal High Point C.F.:	1.000	New C.F.:	1.000

Calibration Standards:	Low Flow Meter ID/Expiry Date:	Defender Low 152020 expires November 21, 2017	High Flow Meter ID/Expiry Date:	Defender High 148943 expires November 21, 2017
	Calibrator ID/Expiry Date:	API id# 627 expires January 27, 2018	Cal Gas Cylinder I.D. #:	LL 165372
	CH ₄ /C ₃ H ₈ Cylinder Conc. (ppm):	606.0	212.0	
	CH ₄ as propane/total CH ₄ equivalents (ppm):	583.0	1189.0	

Standard Calibration Points for a Range of:		50 ppm
Point	Target ppm	
High	38	
Mid	18	
Low	9	

ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

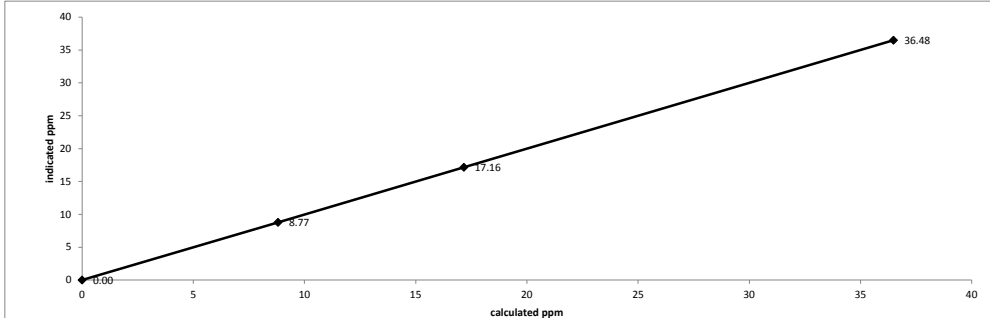
Point	Diluent	Cal Gas	Total	Calculated Concentration (ppm)	Indicated Concentration (ppm)	Correction Factors:
as found zero	2664	0.00	2664	0.0	-0.15	n/a
as found high	2665	84.34	2749	36.48	38.90	0.934
adjusted zero	2664	0.00	2664	0.00	0.00	n/a
adjusted high	2665	84.34	2749	36.48	36.48	1.000
mid	2664	39.02	2703	17.16	17.16	1.000
low	2676	19.98	2696	8.81	8.77	1.005
calibrator zero	2664	0.00	2664	0.0	0.00	n/a

Average C.F.= 1.002

Linear Regression/Calibration Results:

Correlation Coefficient =	1.000	LIMITS	> or = 0.995
Slope =	1.000		0.95-1.05
b (Intercept as % of full scale) =	0.04%		± 3% F.S.
% change in C.F. from last cal =	6.58%		± 10%

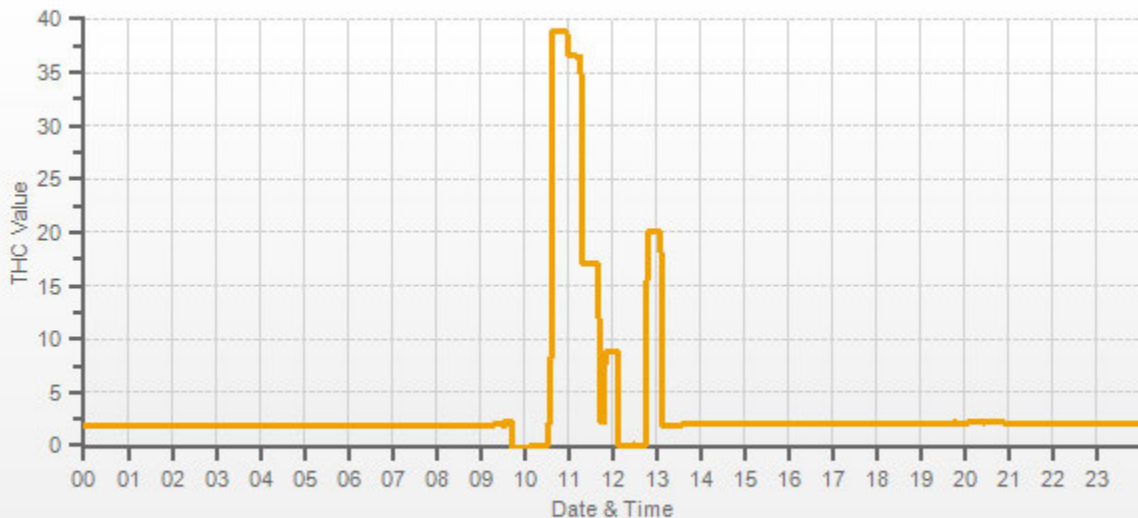
Thermo 51C Total Hydrocarbon Analyzer Calibration



As found:	H2 cylinder (psi):	1300	As left:	H2 cylinder (psi):	1300
	H2 cylinder reg set (psi):	22		H2 cylinder reg set (psi):	22
	Span Cylinder (psi):	400		Span Cylinder (psi):	400
	Span Cylinder Reg Set (psi):	22		Span Cylinder Reg Set (psi):	22
	Zero Air Gen Pressure:	42		Zero Air Gen Pressure:	42
	measurement alarms:	None		measurement alarms:	None
	service alarms:	None		service alarms:	None
	cnt:	1385		cnt:	1360
	rng:	1		rng:	1
	try:	0		try:	0
	flm:	180.9		flm:	180.7
	det:	125.7		det:	125.7
	Flame:	180		Flame:	180
	Filter:	125		Filter:	125
	Base:	125		Base:	125
	Sample psi:	06.51		Sample psi:	06.51
	Internal Air Pressure:	20		Internal Air Pressure:	20
	Internal Fuel Pressure:	13		Internal Fuel Pressure:	13
	Measured Flow:	0.619		Measured Flow:	n/a
	Expected Value:	21.30		Expected Value:	20.10

Comments:
 The analyzer sample inlet filter was changed.
 The manifold blower was found to be working normally.
 The analyzer cooling fan filter(s) were cleaned.

Flow measurement after mid-point.



— THC[ppm]



Thermo 51C Total HydrocarbonTHC Analyzer Calibration

Date:	October 30, 2017	Barometer/B.P./units:	F.S. 05544 expires December 5, 2018	949	millibars
Company/Airshed:	LICA	Thermometer/Station Temp:	F.S. 170286131 expires April 19, 2019	22	°C
Location/Station Name:	Cold Lake South	Weather Conditions:	Cloudy/Overcast		
Parameter:	Total Hydrocarbon	Calibration Purpose:	repeat		
Start/End Time 24 hr. (mst):	10:10 / 14:40	Performed By/Reviewer:	Alex Yakupov	Tom Bourque	
Calibration Method:	Gas Dilution	Cal Gas Expiry Date:	November 25, 2023		

Analyzer:	ID# or Serial Number:	812728560	Range ppm:	50
	Last Calibration Date:	October 11, 2017	As Found C.F.:	1.039
	Previous Cal High Point C.F.:	1.000	New C.F.:	1.000

Calibration Standards:	Low Flow Meter ID/Expiry Date:	Defender Low 152020 expires November 21, 2017	High Flow Meter ID/Expiry Date:	Defender High 148943 expires November 21, 2017
	Calibrator ID/Expiry Date:	Sabio id# 11900613 expires March 16, 2018	Cal Gas Cylinder I.D. #:	LL 165372
	CH ₄ /C ₃ H ₈ Cylinder Conc. (ppm):	606.0	212.0	
	CH ₄ as propane/total CH ₄ equivalents (ppm):	583.0	1189.0	

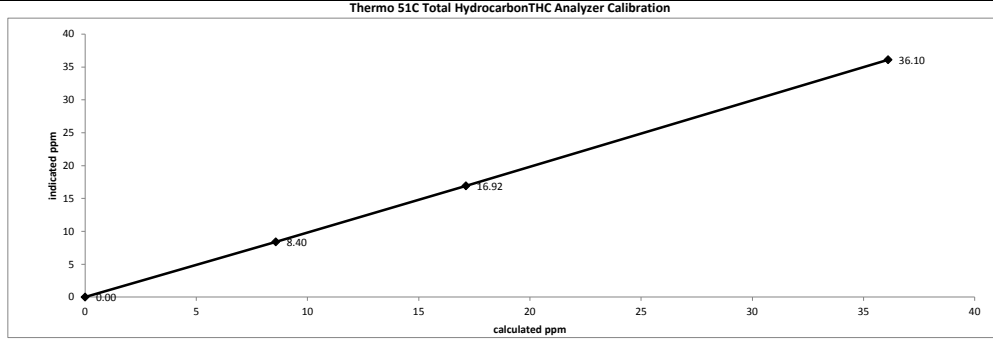
Standard Calibration Points for a Range of: 50 ppm	
Point	Target ppm
High	38
Mid	18
Low	9

ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Point	Diluent	Cal Gas	Total	Calculated Concentration: (ppm)	Indicated Concentration: (ppm)	Correction Factors:
as found zero	2070	0.00	2070	0.0	0.07	n/a
as found high	2006	62.82	2069	36.10	34.80	1.039
adjusted zero	2070	0.00	2070	0.00	0.00	n/a
adjusted high	2006	62.82	2069	36.10	36.10	1.000
mid	2041	29.83	2071	17.13	16.92	1.012
low	2060	14.96	2075	8.57	8.40	1.021
calibrator zero	2070	0.00	2070	0.0	0.00	n/a
Average C.F.=						1.011

Linear Regression/Calibration Results:

Correlation Coefficient =	1.000	LIMITS	> or = 0.995
Slope =	0.999		0.95-1.05
b (Intercept as % of full scale) =	0.23%		± 3% F.S.
% change in C.F. from last cal =	-3.95%		± 10%



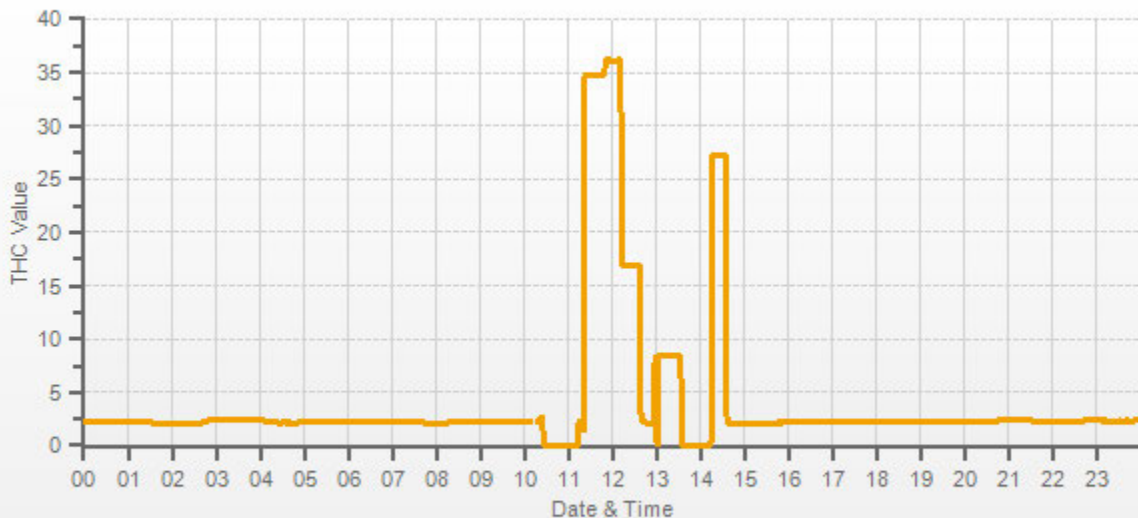
As found:	As left:
H2 cylinder (psi): 600	H2 cylinder (psi): 60
H2 cylinder reg set (psi): 22	H2 cylinder reg set (psi): 22
Span Cylinder (psi): 1800	Span Cylinder (psi): 1800
Span Cylinder Reg Set (psi): 22	Span Cylinder Reg Set (psi): 22
Zero Air Gen Pressure: 42	Zero Air Gen Pressure: 42
measurement alarms: None	measurement alarms: None
service alarms: None	service alarms: None
cnt: 2346	cnt: 1356
rng: 1	rng: 1
try: 0	try: 0
flm: 181.3	flm: 180.7
det: 125.5	det: 125.3
Flame: 181	Flame: 180
Filter: 125	Filter: 125
Base: 125	Base: 125
Sample psi: 06.50	Sample psi: 06.50
Internal Air Pressure: 20	Internal Air Pressure: 20
Internal Fuel Pressure: 13	Internal Fuel Pressure: 13
Measured Flow: 0.6441	Measured Flow: n/a
Expected Value: 26.38	Expected Value: 27.20

Comments:

The manifold blower was found to be working normally.

Repeat calibration was completed to correct ZERO drift

Flow measurement after mid-point.



— THC[ppm]

NITROGEN DIOXIDE



Thermo 42i NO-NO2-NOx Analyzer Calibration

Date: October 10, 2017	Barometer/B.P./units: F.S. 05544 expires December 5, 2018	940	millibars
Company/Airshed: LICA	Thermometer/Station Temp: F.S. 170286131 expires April 19, 2019	22	°C
Location/Station Name: Cold Lake South	Weather Conditions: A few clouds		
Start/End Time 24 hr. (mst): 10:08 / 16:45	Calibration Purpose: routine monthly		
G.P.T. to be used for Ozone? No	Performed By/Reviewer: Alex Yakupov Tom Bourque		
Calibration Method: Gas Dilution & Varying UV Lamp Power	Cal Gas Expiry Date: July 18, 2019		

Analyzer:	Correction Factors:
ID# or Serial Number: 1505664393	Previous C.F.: As Found C.F.: New C.F.:
Last Calibration Date: September 12, 2017	NO = 0.999 1.000 1.000
Range ppb: 500	NO ₂ = 1.000 1.000 1.000
	NOx = 0.999 1.000 1.000

Calibration Standards: Low Flow Meter ID/Expiry Date: Defender Low 152020 expires November 21, 2017 High Flow Meter ID/Expiry Date: Defender High 148943 expires November 21, 2017 Calibrator ID/Expiry Date: API id# 627 expires January 27, 2018 Cal Gas Cylinder I.D. #: LL104222 Cal Gas Conc. (ppm): 50.7 50.7	Standard Calibration Points for a Range of: 500 ppb																								
	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Point</th> <th>Target NO (ppb)</th> <th>Target NO₂ (ppb)</th> <th>Cc Ozone ?</th> </tr> </thead> <tbody> <tr> <td>High</td> <td>380</td> <td>250</td> <td>n/a</td> </tr> <tr> <td>Mid</td> <td>180</td> <td>145</td> <td>n/a</td> </tr> <tr> <td>Low</td> <td>90</td> <td>50</td> <td>n/a</td> </tr> <tr> <td>Extra Point #1</td> <td>n/a</td> <td>n/a</td> <td>n/a</td> </tr> <tr> <td>Extra Point #2</td> <td>n/a</td> <td>n/a</td> <td>n/a</td> </tr> </tbody> </table>	Point	Target NO (ppb)	Target NO ₂ (ppb)	Cc Ozone ?	High	380	250	n/a	Mid	180	145	n/a	Low	90	50	n/a	Extra Point #1	n/a	n/a	n/a	Extra Point #2	n/a	n/a	n/a
Point	Target NO (ppb)	Target NO ₂ (ppb)	Cc Ozone ?																						
High	380	250	n/a																						
Mid	180	145	n/a																						
Low	90	50	n/a																						
Extra Point #1	n/a	n/a	n/a																						
Extra Point #2	n/a	n/a	n/a																						

ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015									
Calibrator Flow Rates (cc/min)				Calculated NO	Calculated NOx	Indicated NO	Indicated NOx	NO C.F.	NOx C.F.
Point	Diluent	Cal Gas	Total Flow	(ppb)	(ppb)	(ppb)	(ppb)		
as found zero	5174	0.0	5174	0	0	0.0	0.0	n/a	n/a
as found high	5268	38.6	5307	369.1	369.1	369.0	369.0	1.000	1.000
adjusted zero	5174	0.00	5174	0.0	0.0	0.0	0.0	n/a	n/a
adjusted high	5268	38.64	5307	369.1	369.1	369.0	369.0	1.000	1.000
mid	5289	17.80	5307	170.1	170.1	170.0	170.0	1.000	1.000
low	5289	8.96	5298	85.7	85.7	85.0	85.0	1.009	1.009
calibrator zero	5174	0.00	5174	0	0	0.0	0.0	n/a	n/a
Average C.F. =								1.003	1.003

ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015										
Calibrator Flow Rates (cc/min)				Calibrator Setting	Indicated NO	Indicated NOx	Indicated NO ₂	NO drop	NO ₂ gain	NO ₂ C.F.
Point	Diluent	Cal Gas	Total Flow	volts or ppb	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)
NOx reference	5268	38.64	5307	0.0	369.0	369.0	0.0	0.0	0.0	
as found high NO ₂	5268	38.64	5307	255.0	120.0	369.0	249.0	249.0	249.0	1.000
adjusted high NO ₂	5268	38.64	5307	255.0	120.0	369.0	249.0	249.0	249.0	1.000
gpt mid	5268	38.64	5307	145.0	227.0	369.0	142.0	142.0	142.0	1.000
gpt low	5268	38.64	5307	50.0	319.0	369.0	50.0	50.0	50.0	1.000
Average NO ₂ C.F. =									1.000	

Linear Regression/Calibration Results:			
	NO	NOx	NO ₂
Correlation Coefficient =	1.000	1.000	1.000
Slope =	1.000	1.000	1.000
b (Intercept as % of full scale) =	-0.06%	-0.06%	0.00%
% change in C.F. from last cal =	-0.14%	-0.14%	0.00%
NO ₂ converter efficiency			1.00

LIMITS
> or = 0.995
0.95-1.05
± 3% F.S.
± 10%
0.96 to 1.04

As found:	As left:
NO Bkg: 3.8	NO Bkg: 3.8
NOx Bkg: 4.0	NOx Bkg: 4.0
NO Coef: 0.959	NO Coef: 0.959
NO ₂ Coef: 0.990	NO ₂ Coef: 0.990
NOx Coef: 0.997	NOx Coef: 0.997
PMT: -854.3	PMT: -854.7
Internal: 27.7	Internal: 29.1
Chamber: 50.4	Chamber: 50.1
Cooler: -2.8	Cooler: -2.7
NO ₂ Converter: 325.0	NO ₂ Converter: 323.4
NO ₂ Converter Set: 325.0	NO ₂ Converter Set: 325.0
Perm Oven Gas: 35.01	Perm Oven Gas: 35.00
Perm Oven Heater: 34.27	Perm Oven Heater: 34.27
Pressure: 177.5	Pressure: 177.5
Flow: 0.770	Flow: 0.778
Ozonator Flow: OK	Ozonator Flow: OK
Expected Value NO: 3	Expected Value NO: 3
Expected Value NO ₂ : 254	Expected Value NO ₂ : 252
Expected Value NOx: 258	Expected Value NOx: 256

Comments:

The analyzer sample inlet filter was changed.

The manifold blower was found to be working normally.

No zero adjustment was required/made.

No high point NO₂ adjustment was required/made.

The analyzer cooling fan filter(s) were cleaned.

No High Point NOx/NO₂ adjustment was required/made.

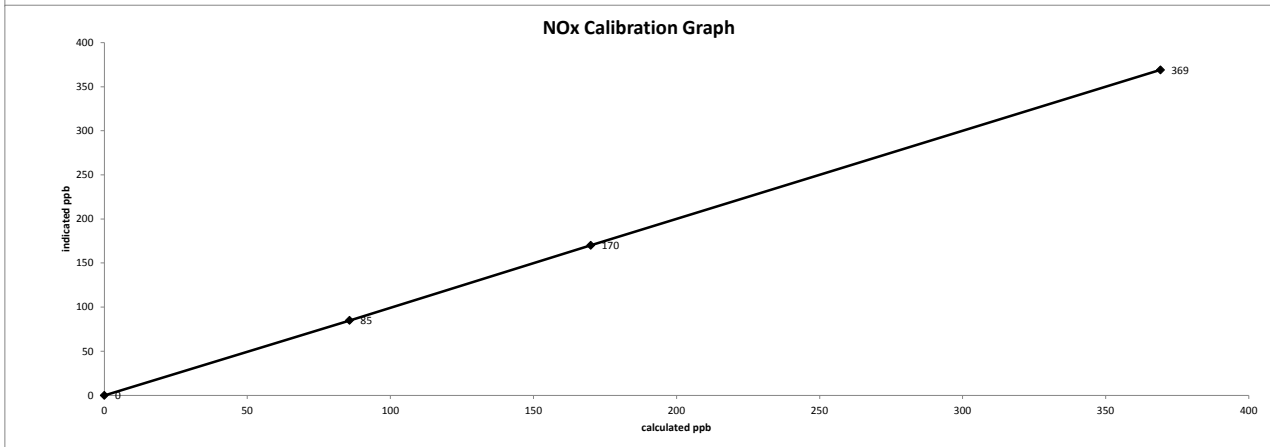
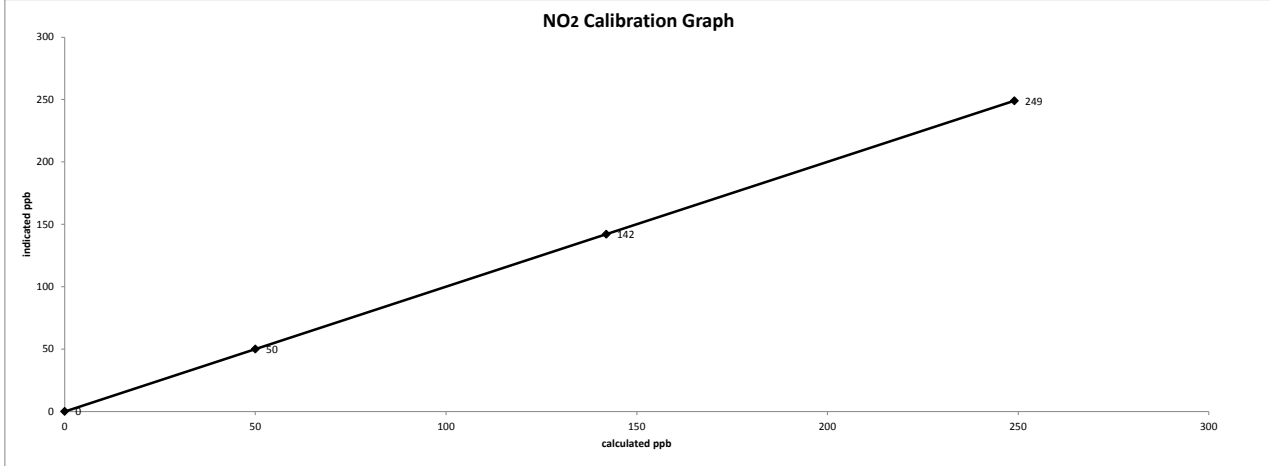
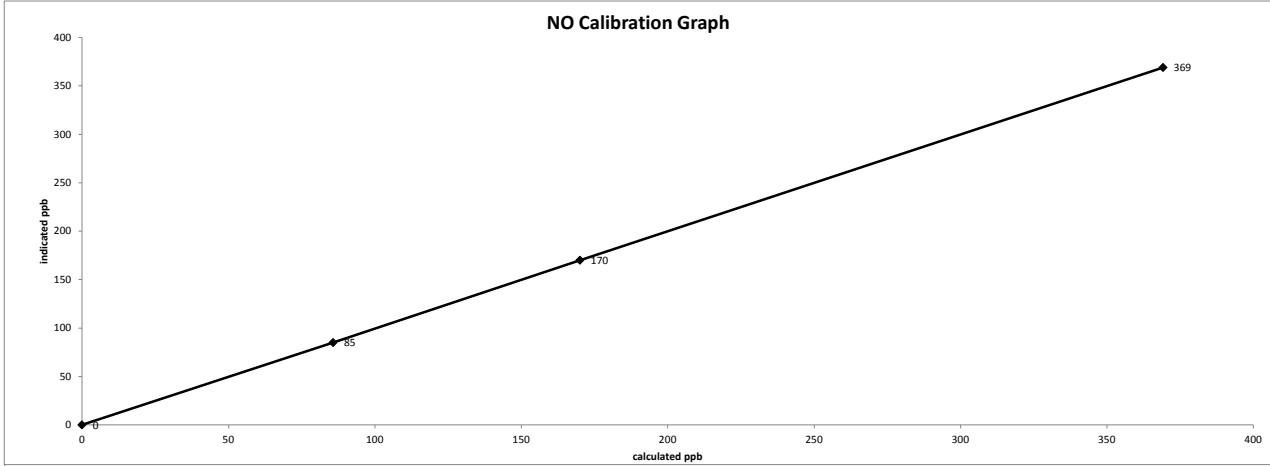
Flow measurement after mid-point.

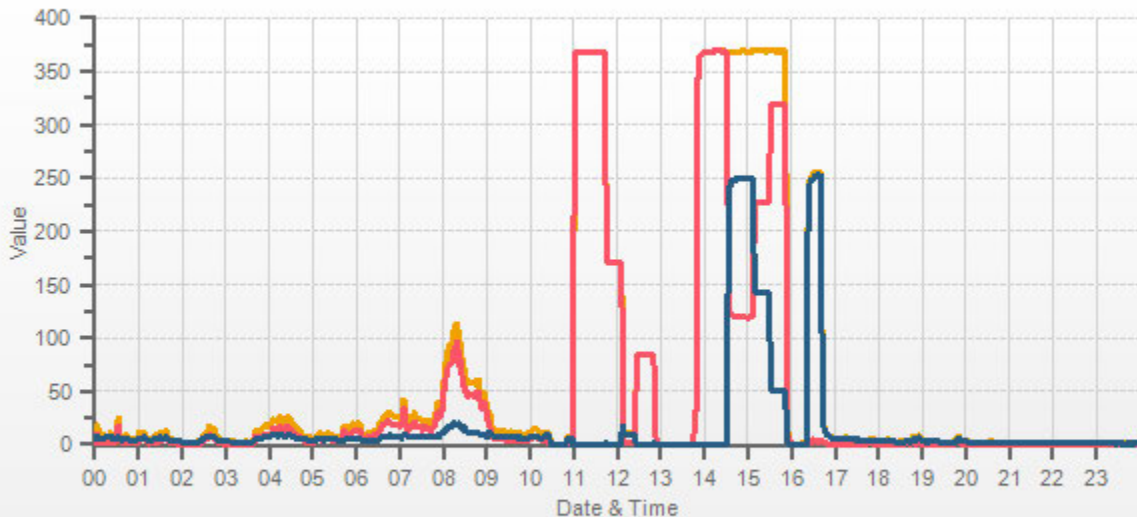
Calibrator concentration (50.7 ppb) derived from original certificate .

Date: October 10, 2017
Company/Airshed: LICA
Location/Station Name: Cold Lake South

Start/End Time 24 hr. (mst): 10:08 / 16:45
Calibration Purpose: routine monthly
Calibration Method: Gas Dilution & Varying UV Lamp Power

Thermo 42i NO-NO2-NOx Analyzer Calibration





— NOX[ppb] — NO[ppb] — NO2[ppb]

OZONE



Thermo 49i Ozone Analyzer Calibration

Date: <u>October 11, 2017</u> Company/Airshed: <u>LICA</u> Location/Station Name: <u>Cold Lake South</u> Start/End Time 24 hr. (mst): <u>9:15 / 13:27</u> Ozone Calibration Method: <u>Varying UV Lamp Power</u> G.P.T. Date: <u>n/a-done by Varying UV Lamp Power</u>	Barometer/B.P./units: <u>F.S. 05544 expires December 5, 2018</u> <u>933</u> <u>millibars</u> Thermometer/Station Temp: <u>F.S. 170286131 expires April 19, 2019</u> <u>23</u> <u>°C</u> Weather Conditions: <u>A few clouds</u> Calibration Purpose: <u>routine monthly</u> Performed By/Reviewer: <u>Alex Yakupov</u> <u>Tom Bourque</u> Cal Gas Expiry Date: <u>n/a-done by Varying UV Lamp Power</u>
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Analyzer: ID# or Serial Number: <u>700419951</u> Last Calibration Date: <u>September 13, 2017</u> Previous Cal High Point C.F.: <u>1.000</u>	Ozone Range ppb: <u>500</u> As Found C.F.: <u>1.005</u> New C.F.: <u>1.000</u>
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Calibration Standards:									
Low Flow Meter ID/Expiry Date: <u>Defender Low 152020 expires November 21, 2017</u> High Flow Meter ID/Expiry Date: <u>Defender High 148943 expires November 21, 2017</u> Calibrator ID/Expiry Date: <u>Sabio id# 11900613 expires March 16, 2018</u> Cal Gas Cylinder I.D. #: <u>n/a</u>	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>Point</th> <th>AMD Required Range of Ozone Calibration Points</th> </tr> <tr> <td>High</td> <td>300-400 ppb</td> </tr> <tr> <td>Mid</td> <td>150-200 ppb</td> </tr> <tr> <td>Low</td> <td>50-75 ppb</td> </tr> </table>	Point	AMD Required Range of Ozone Calibration Points	High	300-400 ppb	Mid	150-200 ppb	Low	50-75 ppb
Point	AMD Required Range of Ozone Calibration Points								
High	300-400 ppb								
Mid	150-200 ppb								
Low	50-75 ppb								

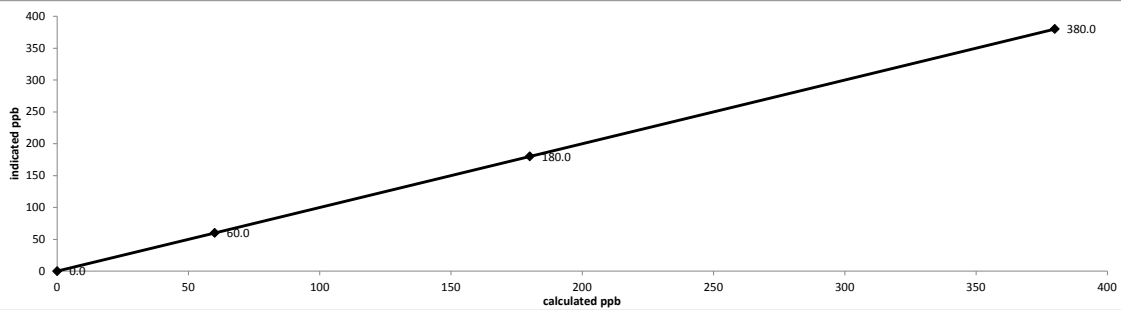
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Point	Calibrator Flow Rate (cc/min)		Calculated Concentration:	Corrected Calculated Concentration:	Indicated Concentration:	Correction Factors:
	Total Flow @ Point Start	Total Flow @ Point Finish	(ppb)	(ppb)	(ppb)	
as found zero	5000	5000	0.0	n/a	0.0	n/a
as found high	5000	5000	380.0	380.0	378.0	1.005
adjusted zero	5000	5000	0.0	0.0	0.0	n/a
adjusted high	5000	5000	380.0	380.0	380.0	1.000
mid	5000	5000	180.0	180.0	180.0	1.000
low	5000	5000	60.0	60.0	60.0	1.000
calibrator zero	5000	5000	0.0	n/a	0.0	n/a
Average C.F.=						1.000

Linear Regression/Calibration Results:

Correlation Coefficient = <u>1.000</u> Slope = <u>1.000</u> b (Intercept as % of full scale)= <u>0.00%</u> % change in C.F. from last cal= <u>-0.53%</u>	LIMITS > or = 0.995 0.95-1.05 ± 3% F.S. ± 10%
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Thermo 49i Ozone Analyzer Calibration

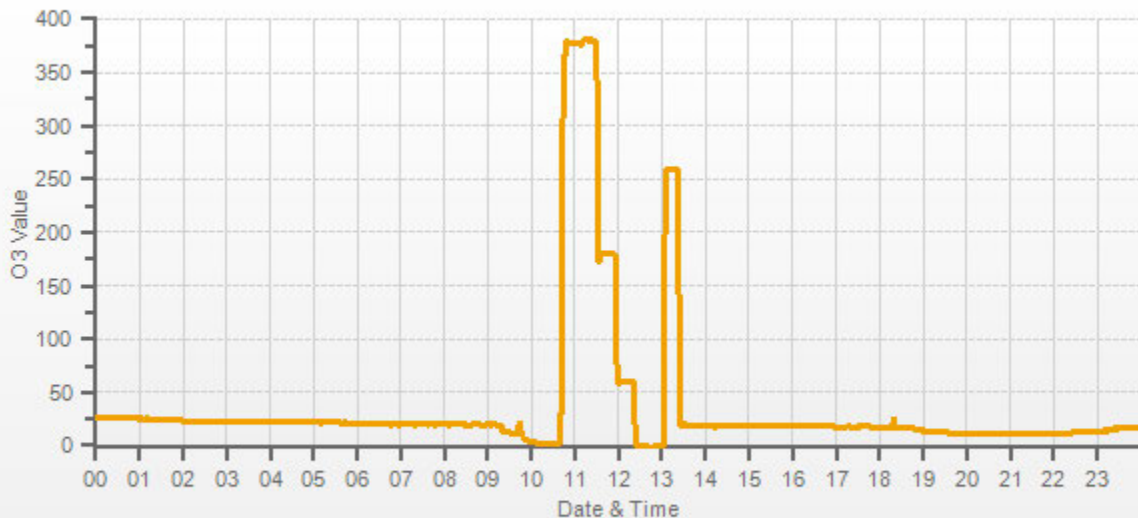


As found: O3 Bkg: <u>0.2</u> O3 Coef: <u>0.984</u> Photo Lamp: <u>9.6</u> O3 Lamp: <u>9.0</u> Bench: <u>30.0</u> Bench Lamp: <u>53.5</u> O3 Lamp: <u>67.4</u> Pressure: <u>700.8</u> Cell A lpm: <u>0.714</u> Cell B lpm: <u>0.753</u> O3 ppb: <u>3.4</u> Cell A ppb: <u>-1.3</u> Cell B ppb: <u>8.0</u> Cell A int: <u>86133</u> Cell B int: <u>86535.0</u> Expected Value: <u>250.0</u>	As left: O3 Bkg: <u>0.2</u> O3 Coef: <u>0.993</u> Photo Lamp: <u>9.6</u> O3 Lamp: <u>9.0</u> Bench: <u>30.1</u> Bench Lamp: <u>53.5</u> O3 Lamp: <u>67.4</u> Pressure: <u>700.2</u> Cell A lpm: <u>0.714</u> Cell B lpm: <u>0.754</u> O3 ppb: <u>0.1</u> Cell A ppb: <u>-5.6</u> Cell B ppb: <u>5.7</u> Cell A int: <u>86074</u> Cell B int: <u>86518.0</u> Expected Value: <u>260.0</u>
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Comments:

The analyzer sample inlet filter was changed.
The analyzer cooling fan filter(s) were cleaned.
The manifold blower was found to be working normally.

No zero adjustment was required/made.



— O3[ppb]

PARTICULATE MATTER

SHARP 5030 Monitor Monthly Audit

Date:	October 11, 2017	Performed By/Reviewer:	Alex Yakupov Tom Bourque
Company:	LICA	Start Time (mst):	12:56
Station Name/Location:	Cold Lake South	End Time (mst):	14:13
Previous Audit Date:	September 20, 2017	Calibration Purpose:	routine monthly
Parameter:	PM 2.5	Weather Conditions:	A few clouds

SHARP Information and Status:			
Serial Number:	CM-2209	Status:	0.00
Approx. % Tape remaining:	8/10	Error Code:	0.00

Reference Standards/I.D./Expiry Date:	
High Flow:	Airmetrics/Chinook High Maxxam ID #2 expires March 24, 2018
Digital Manometer:	Dwyer 475 Mark III id# 3 expires January 3, 2018
Temperature:	F.S. 170286131 expires April 19, 2019
Pressure:	F.S. 05544 expires December 5, 2018
RH:	F.S. 170286131 expires April 19, 2019

As found temperature and pressure:			
Tolerance °C +/-	5	Tolerance mmHg +/-	10
SHARP T1 (°C):	8.0	SHARP P3 (mmHg):	707.00
Reference (°C):	6.8	Reference (mmHg):	705.00
Difference (°C):	-1.2	Difference (mmHg):	-2.0

As left temperature and pressure (same as above if as found adequate):			
Tolerance °C +/-	5	Tolerance mmHg +/-	10
SHARP T1 (°C):	8.0	SHARP P3 (mmHg):	707.00
Reference (°C):	6.8	Reference (mmHg):	705.00
Difference (°C):	-1.2	Difference (mmHg):	-2.0

As found flows:			
SHARP Airflow l/hr	1000.00	Tolerance lpm +/-	5%
Pump Voltage (%)	45.40	SHARP Airflow (lpm)	16.67
		Reference Airflow (lpm)	16.15
		Difference (%)	-3.20%

As left flows (same as above if as found adequate):			
Targets: 1000 l/hr / <90%			
SHARP Airflow l/hr	1000.00	Tolerance lpm +/-	5%
Pump Voltage (%)	45.40	SHARP Airflow (lpm)	16.67
		Reference Airflow (lpm)	16.15
		Difference (l/min)	-3.20%

As found relative humidity:		As left relative humidity (same as "as found" if adequate):	
Tolerance % +/-	3	Tolerance % +/-	3
Sharp RH (%):	n/a	Sharp RH (%):	n/a
Reference RH (%):	n/a	Reference RH (%):	n/a
Difference:	n/a	Difference:	n/a

Inlet Assembly:		
Inlet Head/Sharp Cut	Yes/No?	If no, give reason:
Cleaned:	yes	

Comments:

RH calibration is to be completed during quarterly audit because the RH sensor is located within the monitor and requires disconnecting/equilibrating.

WIND SYSTEM



Met One Instruments
1600 NW Washington Blvd.
Grants Pass, Oregon 97526
Telephone 541-471-7111
Facsimile 541-471-7116

Regional Service
3206 Main St. Suite 106
Rowlett, Texas 75088
Telephone 972-412-4715
Facsimile 972-412-4716

Sonic Wind Sensor Certificate of Calibration

Sensor Model No: 50.5H Sonic Sensor Serial No: F1644
 Customer: _____ P.O. No: _____ Sales Order: _____
 Final Calibration By: Kevin Ricks Calibration Date: 04-01-15
 Quality Control Inspected By: AJR Inspection Date: APR 03 2015
 New Unit Repair/Adjust Re-Calibration As Found
 Unit Within Tolerance as Found Unit Within Tolerance as Left

Calibration Equipment

Equipment	Manufacturer	Model No.	Serial No.	Cal. Due
Digital Multimeter 1	Agilent/HP	34401A	MY41039534	4/11/2015
Digital Multimeter 2	Agilent/HP	34401A	US36094551	8/26/2015
Frequency Counter	Agilent/HP	53131A	MY40009285	5/22/2015
Standard Sensor	MOI	010C-1	P22383	7/11/2017
Temperature Probe	MOI	920005/PC8340	E3402	9/03/2015

Test 1: Average Wind Tunnel Speed: 3.08 Meters per Second FirmwareVersion: 3194-01 R2.62

WD Setting (Deg)	WD Output (Volts)	WD Indication (Deg)	WD Error (+/- 3 Deg)	WS Standard (m/s)	WS Output (Volts)	WS Indication (m/s)	WS Error (+/- .20 m/s)	Output Type:
30	.084	30.3	.3	3.06	.059	2.96	-.1	0 to 1 volt <input checked="" type="checkbox"/>
60	.165	59.3	-.7	3.07	.059	2.94	-.13	0 to 2.5 volt <input type="checkbox"/>
120	.334	120.2	.2	3.08	.059	2.94	-.14	0 to 5 volt <input type="checkbox"/>
150	.415	149.5	-.5	3.07	.059	2.94	-.13	RS-232 <input checked="" type="checkbox"/>
210	.583	210	0	3.08	.059	2.95	-.12	SDI-12 <input type="checkbox"/>
240	.668	240.3	.3	3.08	.06	2.98	-.1	RS-422 <input type="checkbox"/>
300	.834	300.4	.4	3.07	.06	3.02	-.04	RS-485 <input type="checkbox"/>
330	.916	329.8	-.2	3.09	.059	2.97	-.12	<input type="checkbox"/>

Test 2: Average Wind Tunnel Speed: 11.85 Meters per Second Output Range: 0-50 m/s

WD Setting (Deg)	WD Output (Volts)	WD Indication (Deg)	WD Error (+/- 3 Deg)	WS Standard (m/s)	WS Output (Volts)	WS Indication (m/s)	WS Error (+/- .24 m/s)	Test Items:
30	.081	29.3	-.7	11.79	.235	11.76	-.04	Array Alignment <input checked="" type="checkbox"/>
60	.165	59.5	-.5	11.85	.237	11.87	.01	Jumper Config <input checked="" type="checkbox"/>
120	.331	119.1	-.9	11.85	.236	11.81	-.03	Firmware Config <input checked="" type="checkbox"/>
150	.415	149.3	-.7	11.88	.236	11.8	-.08	Zero Calibration <input checked="" type="checkbox"/>
210	.582	209.5	-.5	11.81	.236	11.79	-.02	Low Speed Test OK <input checked="" type="checkbox"/>
240	.666	239.9	-.1	11.88	.235	11.73	-.16	High Speed Test OK <input checked="" type="checkbox"/>
300	.833	299.7	-.3	11.87	.235	11.73	-.13	Sensor Function <input checked="" type="checkbox"/>
330	.915	329.6	-.4	11.84	.238	11.9	.06	Physical Inspection <input checked="" type="checkbox"/>

The standards used for this calibration have accuracies equal to or greater than the instruments tested. These standards are on record and traceable to NIST to the extent allowed by the institute's calibration facility. Unless otherwise stated hereon, all instruments are calibrated to meet the manufacturer's published specifications. The calibration system complies with MIL-STD-45662A. Calibration performed by direct comparison to the above standard following test procedure: 50.5-6100 Rev E



Meteorological Sensor Audit/Calibration

Location Information

Company:	LICA	Performed By:	Alex Yakupov
Audit Location:	Cold Lake South	Reviewed By:	Tom Bourque
Audit Date:	October 23, 2017	Start/End Time (mst):	11:36 / 15:19
Calibration Purpose:	installation	Weather Conditions:	Mainly sunny

Wind Sensor Information

Sensor ID Data:		Sensor Outputs:	
Sensor Make:	RM Young	Velocity Voltage Output Range:	0-1V
Sensor Model:	05305VK	Velocity Unit Output Range:	0-200 km/h
Serial #:	92411	Direction Voltage Output Range:	0-1V
Previous Cal/Audit Date:	n/a or unknown	Direction Unit Output Range:	0-360 degrees

Wind Calibrator Information

Calibrator I.D. and Expiry Date: (SIA) RM Young 18802 sn/id# CA4309 expires February 24, 2018

Wind Speed Audit Data ****+/- 2% of the average correction factor is the limit****

RPM	Wind Speed Generated kph	Clockwise Wind Speed kph	Counter Clockwise Wind Speed kph	Correction Factor
0	0	0.0	0.0	-
1000	18.4	18.4	18.5	0.997
2000	36.9	36.9	36.9	1.000
3000	55.3	55.4	55.4	0.999
4000	73.7	73.8	73.8	0.998
5000	92.2	92.3	92.3	0.999
6000	110.6	110.7	110.7	0.999
7000	129.0	129.1	129.1	0.999
8000	147.4	147.5	147.5	0.999
9000	165.9	165.9	166.0	1.000
10000	184.3	184.3	184.4	1.000
The audit meets AMD requirements.			Average Correction Factor=	0.999

Wind Direction Audit Data ****+/- 5° of the absolute average degrees difference for all points is the limit****

Generated Wind Direction 0-360 (Up)	Generated Wind Direction 360-0 (Down)	Indicated Wind Direction 0-360 (Up)	Indicated Wind Direction 360-0 (Down)	Degrees Difference 0-360 (Up)	Degrees Difference 360-0 (Down)	Average Absolute Degrees Difference
0	355	0	355	0.2	-0.1	0.2
30	330	31	330	-1.2	0.5	0.9
60	300	61	300	-1.3	0.0	0.6
90	270	92	270	-1.5	-0.2	0.8
120	240	122	241	-1.5	-0.5	1.0
150	210	152	211	-1.6	-0.8	1.2
180	180	181	181	-1.3	-1.4	1.4
210	150	211	151	-1.3	-0.8	1.1
240	120	241	121	-0.6	-0.9	0.8
270	90	271	91	-0.8	-1.0	0.9
300	60	301	61	-0.5	-1.1	0.8
330	30	330	30	-0.1	-0.3	0.2
355	0	355	0	-0.2	0.3	0.2
The audit meets AMD requirements.			Average Absolute Degrees Difference=		0.8	

Comments:

The RM Young Wind System was installed to replace a Sonic Wind System Met One for by-annual calibration at a factory.

CALIBRATORS

Company Maxxam/SIA Operator: Chris

Calibrator:			Flow Measurement Device:		
Make/Model	<u>API 700</u>		Make/Model	<u>Definer 530</u>	
Serial Number	<u>627</u>		Serial Number	<u>H-148944, L-152019</u>	
Last Verification Date	<u>February 3, 2016</u>		Temperature (°C)	<u>23.5</u>	
NO Cylinder S/N	<u>EY0000597</u>		Barometric Pressure	<u>707.1 mmHg</u>	
NO [PPM]	<u>49.0</u>	NOx [PPM]	<u>49.0</u>		
Expiry Date	<u>December 8, 2019</u>				

Dilution Flow (sccm)					
Pt. #1	<u>4892</u>	Pt. #2	<u>4975</u>	Pt. #3	<u>4951</u>
Gas Flow (sccm)					
Pt. #1	<u>79.7</u>	Pt. #2	<u>38.8</u>	Pt. #3	<u>19.4</u>

Calibrator Flow (sccm)		Calculated Conc.(ppm)		Indicated Conc.(ppm)			% Difference vs Audit Gas	
Dilution	Gas	NO	NOx	NO	NO ₂	NOx	NO	NOx
	0.0	0.0000	0.0000	0.0000	-0.0004	-0.0004	Limit ± 10%	
4972	79.7	0.7855	0.7855	0.7883	0.0004	0.7887	0.4%	0.5%
4936	38.8	0.3822	0.3822	0.3816	0.0005	0.3822	-0.2%	0.1%
4970	19.4	0.1913	0.1913	0.1902	0.0006	0.1913	-0.6%	0.2%
Absolute Average Percent Difference							0.1%	0.3%

LINEAR REGRESSION ANALYSIS *y=mx+b (where x=calculated concentration, y=indicated concentration)*

NO	LIMITS	NOx
Correlation= 1.0000	≥ 0.990	Correlation= 1.0000
m (Slope)= 1.0041	0.90-1.10	m (Slope)= 1.0046
b (Intercept % of FS)= -0.1118	± 3% F.S.	b (Intercept % of FS)= -0.0871

Flow	O ₃ Conc	NO Decrease	NO	NO ₂	NOX	% Diff. Vs Audit gas	
4972	0	0.0000	0.7867	0.0014	0.7881	NO ₂	% Diff, Limit
4972	500	0.5127	0.2740	0.5104	0.7849	-0.7%	± 10%
4972	275	0.2863	0.5004	0.2860	0.7865	-0.6%	± 10%
4972	90	0.0940	0.6927	0.0954	0.7880	0.0%	± 10%
Absolute Average Percent Difference						0%	± 10%

LINEAR REGRESSION ANALYSIS *y=mx+b (where x=calculated concentration, y=indicated concentration)*

NO₂	LIMITS
Correlation= 1.0000	≥ 0.995
m (Slope)= 0.9924	0.90-1.10
b (Intercept % of FS)= 0.1755	± 3% F.S.

AENV Standards		NO_x Analyzer	
Audit Calibrator		Make/Model	<u>Thermo 42i</u>
Make/Model	<u>Thermo 146i</u>	Serial/AMU Number	<u>AMU 1868</u>
Serial/AMU Number	<u>AMU1809</u>	Last Calibration Date	<u>January 25, 2017</u>
SRM Gas Cylinder No.	<u>CAL018140</u>	Full Scale (ppm)	<u>1.0</u>
Cylinder Conc. (ppm)	<u>48.79</u>	Cylinder Gas Expiry Date	<u>March 25, 2019</u>

COMMENTS: _____

Auditor: Shea Beaton Date: January 27, 2017
Operator Signature: _____ Location: McIntyre Center Edmonton

Company <u>Maxxam</u>		Operator: <u>Mike</u>	
Calibrator:		Flow Measurement Device:	
Make/Model	<u>Sabio 2010D</u>	Make/Model	<u>Bios Defender 530</u>
Serial Number	<u>11900613</u>	Serial Number	<u>HI148944 Lo 152019</u>
Last Verification Date	<u>March 31, 2016</u>	Temperature (°C)	<u>23.9</u>
NO Cylinder S/N	<u>EY0000769</u>	Barometric Pressure	<u>698mmHg</u>
NO [PPM]	<u>51.1</u>	NOx [PPM]	<u>51.2</u>
Expiry Date	<u>December 8, 2019</u>		

Dilution Flow (sccm)		
Pt. #1 <u>4879</u>	Pt. #2 <u>4932</u>	Pt. #3 <u>4950</u>
Gas Flow (sccm)		
Pt. #1 <u>74.5</u>	Pt. #2 <u>36.4</u>	Pt. #3 <u>18.2</u>

Calibrator Flow (sccm)		Calculated Conc.(ppm)		Indicated Conc.(ppm)			% Difference vs Audit Gas	
Dilution	Gas	NO	NOx	NO	NO ₂	NOx	NO	NOx
4965	0.0	0.0000	0.0000	0.0001	0.0000	0.0001	Limit ± 10%	
4954	74.5	0.7685	0.7700	0.7915	0.0008	0.7923	3%	3%
4968	36.4	0.3744	0.3751	0.3832	0.0006	0.3838	2%	2%
4968	18.2	0.1872	0.1876	0.1916	0.0002	0.1918	2%	2%
Absolute Average Percent Difference							3%	2%

LINEAR REGRESSION ANALYSIS $y=mx+b$ (where x=calculated concentration, y=indicated concentration)

NO	LIMITS	NOx
Correlation= 1.0000	≥ 0.990	Correlation= 1.0000
m (Slope)= 1.0301	0.90-1.10	m (Slope)= 1.0291
b (Intercept % of FS)= -0.0919	± 3% F.S.	b (Intercept % of FS)= -0.0881

Flow	O ₂ Conc	NO Decrease	NO	NO ₂	NOX	% Diff. Vs Audit gas	
4954	0.000	0.0000	0.7949	0.0005	0.7954	NO ₂	% Diff. Limit
4954	0.510	0.5104	0.2845	0.5072	0.7917	-1%	± 10%
4954	0.250	0.2516	0.5433	0.2514	0.7944	0%	± 10%
4954	0.100	0.1085	0.6864	0.1087	0.7951	0%	± 10%
Absolute Average Percent Difference						0%	± 10%

LINEAR REGRESSION ANALYSIS $y=mx+b$ (where x=calculated concentration, y=indicated concentration)

NO ₂	LIMITS
Correlation= 1.0000	≥ 0.995
m (Slope)= 0.9926	0.90-1.10
b (Intercept % of FS)= 0.0925	± 3% F.S.

AENV Standards		NO_x Analyzer	
Audit Calibrator		Make/Model	<u>Thermo 42i</u>
Make/Model	<u>Thermo 146i</u>	Serial/AMU Number	<u>1868</u>
Serial/AMU Number	<u>1809</u>	Last Calibration Date	<u>March 15, 2017</u>
SRM Gas Cylinder No.	<u>CAL018140</u>	Full Scale (ppm)	<u>1.0</u>
Cylinder Conc. (ppm)	<u>48.79</u>	Cylinder Gas Expiry Date	<u>March 28, 2019</u>

COMMENTS: Gas has ~50ppm SO2

Auditor: Shea Beaton
Operator Signature: [Signature]

Date: March 16, 2017
Location: McIntyre Center Edmonton

CALIBRATION GASES



Calibration Gas Audit

Single Component Cylinder Gas

File No. 2016-335CGA

Company: Maxxam **Operator's Name:** Russell Kirchner
Cylinder #: LL104222 **Concentration PPM:** 50.6 **Tolerance(%)** 1 **Certified By:** Praxair
Expiry Date: July 2019

Reference Calibrator and Gas:	Flow Measurement Device:
Make/Model: <u>R&R MFC 201</u>	Make/Model: <u>Bios DC2</u>
Serial Number: <u>AMU 1690</u>	Serial Number: <u>AMY 1659</u>
Last Verification Date: <u>October 19, 2016</u>	Temp. °C: <u>24.5 C</u>
Gas Type: <u>SO2</u> Conc. <u>98.07</u>	B.P. <u>706 mmhg</u>
Cylinder Number: <u>CA:016625</u>	
Expiry Date: <u>January 2019</u>	

Reference Analyzer:
 Make/Model: Teco 43C Serial/AMU Number: 1623
 Instrument Settings: Zero: 9.2 Span: 1.024 Range: 1.0
 Last Calibration: Date: Oct 19/16 C.F. 1.000 Done By: Al Clark

Calibrator Flows (sccm)		Indicated Concentration (PPM)	Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration
Dilution	Gas				
5000	0.0	0.000	0.0000	0.0000	0.000
4935	82.0	0.830	0.01662	60.183	50.0
4968	40.8	0.412	0.00821	121.765	50.2
4955	20.2	0.203	0.00408	245.297	49.8
Average Cylinder Concentration:					50.0

Previous Stated Concentration PPM: 50.6

Percent variance from Stated: 1

Meets Manufacturer Tolerance. Use manufacturers stated concentration **COMMENTS:** _____
 < =5% Outside Manufacturer Tolerance. Use manufacturers concentration _____
 > 5% Outside Manufacturer Tolerance. **DO NOT USE** this cylinder _____

Auditor: Al Clark
 Operator Signature:

Date: October 19, 2016
 Location: McIntyre Center Edmonton



Calibration Gas Audit

Single Component Cylinder Gas

File No. 2016-334CGA

Company: Maxxam **Operator's Name:** Russell Kirchner

Cylinder #: EY0000654 Concentration PPM: 10.2 Tolerance(%): 2 Certified By: Praxair

Expiry Date: June 2019

Reference Calibrator and Gas:	Flow Measurement Device:
Make/Model: <u>R&R MFC 201</u>	Make/Model: <u>Bios DC2</u>
Serial Number: <u>AMU 1690</u>	Serial Number: <u>AMU 1659</u>
Last Verification Date: <u>October 19, 2016</u>	Temp. °C: <u>24.0 C</u>
Gas Type: <u>H2S</u> Conc. <u>20.43</u>	B.P. <u>706 mmhg</u>
Cylinder Number: <u>CAL015584</u>	
Expiry Date: <u>January 2019</u>	

Reference Analyzer:

Make/Model: Teco 450i Serial/AMU Number: 1980

Instrument Settings: Zero: 16.6 Span: 1.231 Range: 0.1

Last Calibration: Date: Oct 19/16 C.F. 1.000 Done By: Al Clark

Calibrator Flows (sccm)		Indicated Concentration (PPM)	Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration
Dilution	Gas				
5000	0.0	0.0000	0.0000	0.0000	0.0000
5050	38.0	0.0764	0.00752	132.895	10.2
5050	17.8	0.0355	0.00352	283.708	10.1
5023	9.1	0.0182	0.00181	551.978	10.0
Average Cylinder Concentration:					10.1

Previous Stated Concentration PPM: 10.2

Percent variance from Stated: 1

Meets Manufacturer Tolerance. Use manufacturers stated concentration **COMMENTS:** _____

<=5% Outside Manufacturer Tolerance. Use manufacturers concentration _____

> 5% Outside Manufacturer Tolerance. **DO NOT USE** this cylinder _____

Auditor: Al Clark Date: October 19, 2016

Operator Signature: *Al Clark* Location: McIntyre Center Edmonton



Calibration Gas Audit

CH4 / C3H8 Cylinder Gas

File No. 2015-092CGA

Company: Maxxam **Operators name:** Chris Wesson
Cylinder #: LL165372 **Conc CH4 (PPM)** 606/212 **Tolerance (%)** 0.5 **Certified By:** Praxair

Reference Calibrator and Gas:

Make/Model R&R MFC 201
 Serial Number AMU 1698
 Last Verification Date January 18, 2016
 Gas Type CH4 Conc. 999.2
 Cylinder Number D751932
 Gas Type C3H8 Conc. 246.5
 Cylinder Number XF0037998

Flow Measurement Device:

Make/Model Bios DC-2
 Serial Number Bios D
 Temp. °C 24.5
 B.P. 698mmHg

Reference Analyzer:

Make/Model Thermo 55C Serial/AMU Number: 1643
 Instrument Settings Zero: NA Span: NA Range: 20.0
 Last Calibration: Date: 18-Jan-16 C.F. 1.000 Done By: SB

Calibrator Flows (scem)		Indicated Conc. (ppm)		Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration	
Dilution	Gas	CH4	C3H8			CH4	C3H8
2568	0.00	0.00	0.00	0.02140	46.722	607	214
2630	56.29	12.99	12.62	0.02140	46.722	607	214
2588	19.73	4.62	4.50	0.00762	131.171	606	215
2580	9.69	2.29	2.24	0.00376	266.254	610	217
Average Cylinder Concentration:						608	215

	CH4		C3H8
Previous Stated Concentration PPM:	<u>606</u>		<u>212</u>
Percent variance from Stated:	<u>0.3</u>		<u>1.6</u>

Cylinder gas tolerances based on CH4 only

Meets Manufacturer Tolerance. Use manufacturers stated concentration **COMMENTS:** _____
 <=5% Outside Manufacturer Tolerance. Use manufacturers concentration C3H8 manufacturers tolerance 1.1%
 > 5% Outside Manufacturer Tolerance. **DO NOT USE** this cylinder

Auditor: Shea Beaton
 Operator Signature: _____

Date: January 19, 2016
 Location: McIntyre Center Edmonton



Calibration Gas Audit

NO Cylinder Gas

File No. 2016-336CGA

Company: Maxxam **Operators name:** Russell Kirchner
Cylinder #: LL104222 **Conc (PPM)** 50.7/50.9 **Tolerance (%)** 1 **Certified By:** Praxair
Expiry Date: July 2019

Reference Calibrator and Gas:				Flow Measurement Device:	
Make/Model	<u>Teco 146i</u>			Make/Model	<u>Bios DC2</u>
Serial Number	<u>AMU 1809</u>			Serial Number	<u>AMU 1659</u>
Last Verification Date	<u>October 19, 2019</u>			Temp. °C	<u>24.5 C</u>
Gas Type	<u>NO</u>	Conc.	<u>48.79</u>	B.P.	<u>706 mmhg</u>
Cylinder Number	<u>CAL018188</u>				
Expiry Date	<u>March 2019</u>				

Reference Analyzer:
 Make/Model Teco 42i Serial/AMU Number: 1868
 Instrument Settings Zero: 4.4 Span: 1.080 Range: 1.0
 Last Calibration: Date: Oct 18/16 C.F. 1.000 Done By: Al Clark

Calibrator Flows (sccm)		Indicated Conc. (ppm)		Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration	
Dilution	Gas	NO	NOX			NO	NOX
5000	0.0	0.000	0.000				
4935	82.0	0.838	0.837	0.017	60.183	50.4	50.4
4968	40.8	0.417	0.417	0.008	121.765	50.8	50.8
4955	20.2	0.207	0.207	0.004	245.297	50.8	50.8
Average Cylinder Concentration:						50.7	50.6

<u>NO</u>	<u>NOx</u>
Previous Stated Concentration PPM: <u>50.7</u>	<u>50.9</u>
Percent variance from Stated: <u>0</u>	<u>1</u>

Cylinder gas tolerances based on NO only

Meets Manufacturer Tolerance. Use manufacturers stated concentration **COMMENTS:**
 < =5% Outside Manufacturer Tolerance. Use manufacturers concentration Contains 50.6 ppm SO2.
 > 5% Outside Manufacturer Tolerance. **DO NOT USE** this cylinder

Auditor: Al Clark Date: October 19, 2016
 Operator Signature: *Al Clark* Location: McIntyre Center Edmonton

***APPENDIX III
REPORT CERTIFICATION FORM***

Report Certification Form

Alberta Airshed (if applicable)	EPA Approval or Code of Practice Registration # (if applicable)
YES	NA
Company Name (if applicable)	Industrial Operation Name (if applicable)
Lakeland Industry & Community Association	Cold Lake Continuous Monitoring Station
Name of the Representative of the Person Responsible (Last, First, Middle)	Position / Title of the Representative of the Person Responsible
Maram Ghaleb	Project Manager, Customer Service, Air Services
Is an External Party Certifying the Report? (If 'Yes', fill in the fields below for the external person.)	
<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Name of External Person Certifying the Report (Last, First, Middle)	Position / Title of External Person Certifying the Report
NA	NA
Company Name for the External Person Certifying the Report	Identification of Qualifications / Professional Designations of the External Person Certifying the Report
NA	NA

I certify that I have reviewed and verified the submitted report. I also certify that the report presented with this certification form is complete, accurate and representative of the monitoring results and timeframe.

Maram Ghaleb

Signature of the Representative of the Person Responsible / External Person Certifying the Report

November 29, 2017

Report Issued Date (dd-mm-yyyy)

APPENDIX IV
DATA VALIDATION CERTIFICATION FORM



Validation Certificate Form

Client: <u>Lakeland Industry & Community Association</u>	Project #: <u>2833-2017-10-1-C</u>
Site: <u>Cold Lake Continuous Monitoring Station</u>	Contact: <u>Mike Bisaga</u>

Level 0 Preliminary Verification	<u>Maram Ghaleb</u>	Date <u>November 06, 2017</u>
Level 1 Primary Validation	<u>Maram Ghaleb</u>	Date <u>November 06, 2017</u>
Level 2 Final Validation	<u>Maram Ghaleb</u>	Date <u>November 29, 2017</u>
Level 3 Independent Data Review	<u>cuslmha</u>	Date <u>November 29, 2017</u>
Post-Final Validation	<u>NA</u>	Date <u>NA</u>

Notes
The Post-Final Validation step serves to re-evaluate the data that errors or omissions are discovered and/or suspected after the initial submittal of data. This validation is performed on an annual basis.



Alberta Environment and Parks (AEP)
Air.Reporting@gov.ab.ca

December 13, 2017

Subject: Monthly Report Submission for the LICA Maskwa station

Lakeland Industry & Community Association (LICA) is pleased to submit the ambient air monitoring monthly report for the LICA Maskwa AQM Station in the month of October 2017.

The air monitoring program consists of continuous air monitoring results for Sulphur Dioxide (SO₂), Hydrogen Sulphide (H₂S), Total Hydrocarbon (THC), Oxides of Nitrogen (NO_x), Nitric Oxides (NO), Nitrogen Dioxide (NO₂), Relative Humidity (RH), Barometric Pressure (BP), Precipitation, Ambient Temperature (AmbTPX), Wind Speed (WS), Wind Direction (WD) and Standard Deviation Wind Direction (STDWD).

Sampling Program	Monitoring Activities Conducted By	Sample Analysis Conducted By	Data/Report Review and Prepared By	Electronic Submission Conducted By
Continuous ambient air	Maxxam Analytics	Maxxam Analytics	Maxxam Analytics	Maxxam Analytics

All data collected in October 2017 was compliant with the requirements outlined in the Air Monitoring Directive (Alberta Environment and Parks, 2016).

The operational time for all continuous ambient air analyzers, meteorological systems and data acquisition systems were above the 90% requirement systems.

NO₂/NO/NO_x: The LICA owned analyzer (API200E, s/n: 592) was installed on October 18 after it had undergone manufacturer's maintenance. An installation calibration was performed on October 19. The GPT calibration was repeated on October 20 for quality assurance purposes.

As the LICA Environmental Program Manager and Data & Reporting Specialist, we certify that we have reviewed and verified this report and that the information is complete, accurate and representative of the monitoring results, reporting timeframe and the specified analysis, summarization and reporting requirements. We also certify all air data that are required by the AMD to be electronically submitted to AEP and Alberta's Ambient Air Quality Data Warehouse have been submitted by the time of this report submission.

Should you have any questions, please don't hesitate to contact me.

Respectfully,



Lakeland Industry & Community Association
5107 50 St
Bonnyville, AB T9N 2J7

A handwritten signature in blue ink that reads 'Michael Bisaga'.

Michael Bisaga
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AMBIENT AIR MONITORING MONTHLY DATA REPORT
LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
MASKWA CONTINUOUS MONITORING STATION

JOB #: 2833-2017-10-30-C

October 2017

Prepared for:

LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

5107 50 ST.
BONNYVILLE, ALBERTA
T9N 2J7

Attention: MIKE BISAGA

DATE: **November 30, 2017**

Prepared by:

Nazek AL-Hadi

Nazek AL-Hadi, M.Sc.

Project Manager Assistant, Customer Service, Air Services

Reviewed by:

Wunmi Adekanmbi

Wunmi Adekanmbi, M.Sc., EPT.

Project Manager, Customer Service, Air Services

SUMMARY

In October, Maxxam Analytics was contracted to manage the ambient air quality monitoring and maintenance activities at the Maskwa Continuous Monitoring Station, near Bonnyville, Alberta. The monitoring station provides continuous meteorological measurements and air quality data for non-compliance parameters, as requested by Lakeland Industry & Community Association.

All data collected this month was compliant with the requirements outlined in the Air Monitoring Directive (Alberta Environment and Parks, 2016).

The operational time for all continuous ambient air analyzers, meteorological systems and data acquisition systems were above the 90% requirement.

H₂S: The analyzer exhibited instability in zero/span response throughout the month. Eleven hours of downtime were recorded due to additional quality checks performed to address these events.

THC: Eight hours of downtime were recorded due to additional quality checks performed on October 24 (06:00-07:00) and October 26 (07:00/13:00-17:00) to address a drift in zero response.

NO_x/NO₂/NO:

- LICA's analyzer (API 200E, s/n: 592) was installed on October 18 and calibrated on October 19, after it had returned from the manufacturer where it was sent for maintenance. The GPT component of the calibration was repeated on October 20 for quality assurance purposes. Forty-four hours of downtime were recorded this month due to this event.
- Ten hours of downtime were recorded between October 26 and October 27 due to additional quality checks performed to address a drift in span response.

The summary of results is presented on the following pages.

Any deviations or modifications made to the sampling or analytical methods are outlined in Section 1.0, Discussion. On this basis, Maxxam Analytics is issuing this completed report to Lakeland Industry & Community Association, Maskwa Continuous Monitoring Station.

Should you have any questions concerning the results or if we can be of further assistance, please contact us at 403-219-3677 or toll-free at 1-800-386-7247.

Monthly Continuous Data Summary

Lakeland Industry & Community Association Maskwa Continuous Monitoring Station						MAXIMUM VALUES							OPERATIONAL TIME (%)
PARAMETER	OBJECTIVES		EXCEEDANCES		MONTHLY AVERAGE	1-HOUR					24-HOUR		
	1-hr	24-hr	1-hr	24-hr		READING	DAY	HOUR	WIND SPEED (kph)	WIND DIRECTION (sector)	READING	DAY	
SO ₂ (ppb)	172	48	0	0	1	17	21	4	5.8	WNW	4	21	100.0
H ₂ S (ppb)	10	3	0	0	0	2	17	20	18.3	WNW	1	17	98.5
THC (ppm)	-	-	-	-	2.20	3.11	17	20	18.3	WNW	2.58	26	98.9
NO ₂ (ppb)	159	-	0	-	3	19	28	19	11.0	NW	7	28	94.1
NO (ppb)	-	-	-	-	1	14	3	3	2.4	SW	2	3	94.1
NO _x (ppb)	-	-	-	-	3	28	28	19	11.0	NW	9	28	94.1
RELATIVE HUMIDITY (%)	-	-	-	-	72	91	15	4	4.2	SW	88	25	100.0
BAROMETRIC PRESSURE (millibar)	-	-	-	-	936	954	29	20	3.7	N	950	26	100.0
AMBIENT TEMPERATURE (°C)	-	-	-	-	3.3	18.6	5	14	13.3	SSW	11.1	5	100.0
PRECIPITATION (mm)	-	-	-	-	0.1	5.9	17	18	16.2	WNW	0.5	25	100.0
VECTOR WS (kph)	-	-	-	-	2.3	19.4	18	2	-	WNW	12.5	2	100.0
VECTOR WD (sec)	-	-	-	-	295 (WNW)	-	-	-	-	-	-	-	100.0

Exceedance Summary Report

SO₂ 1-Hour Exceedances

Measured concentrations of sulphur dioxide were below the 1-hour AAAQO of 172 ppb.

SO₂ 24-Hour Exceedances

Measured concentrations of sulphur dioxide were below the 24-hour AAAQO of 48.0 ppb.

H₂S 1-Hour Exceedances

Measured concentrations of hydrogen sulphide were below the 1-hour AAAQO of 10 ppb.

H₂S 24-Hour Exceedances

Measured concentrations of hydrogen sulphide were below the 24-hour AAAQO of 3 ppb.

NO₂ 1-Hour Exceedances

Measured concentrations of nitrogen dioxide were below the 1-hour AAAQO of 159 ppb.

In accordance with EPEA and the Substance Release Regulation.

In accordance with A Guide to Release Reporting and the Alberta Ambient Air Quality Objectives and Guidelines Summary.

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1.0 Discussion

This monthly report consists of continuous monitoring results for the following parameters: Sulphur Dioxide (SO₂), Hydrogen Sulphide (H₂S), Total Hydrocarbon (THC), Oxides of Nitrogen (NO_x), Nitric Oxides (NO), Nitrogen Dioxide (NO₂), Relative Humidity (RH), Barometric Pressure (BP), Precipitation, Ambient Temperature (AmbTPX), Wind Speed (WS), Wind Direction (WD) and Standard Deviation Wind Direction (STDWD).

The sample inlet filter for all continuous air analyzers are replaced before the calibration begins. The sample manifold is cleaned during the site visit each month.

Control checks, consisting of a zero and span, are conducted daily on all continuous air monitors. In place of the air sample, zero air (from scrubbed air or gas cylinders) is used for zero checks, and a known concentration of the pollutant being analyzed is used for span checks. These checks are controlled by automatic timers and valves. The total zero span cycle is completed within an hour, the commencement of the zero span cycle is at the beginning of the hour.

Multipoint calibrations are done a minimum of once a month for each continuous air monitor. An additional calibration is required under the following conditions: 1) within three days after the initial start-up and stabilization of a newly installed instrument, 2) prior to shut-down or moving of an instrument which has been working to specification, and 3) when major repair has been done on the instrument.

Time during the first multi-point calibration is not considered downtime (Data is flagged as C). If more than one calibration is performed during the month, the time during the additional calibration is considered as downtime (Data is flagged as C1).

Only one zero/span check is run per day. Time during the zero/span check is not considered as downtime (Data is flagged as S). If an extra zero/span check is performed, the time during the additional check is considered as downtime (Data is flagged as S1).

The AMD requires each instrument and accompanying data recording system to be operational 90% of the time, at a minimum, for each monthly monitoring period.

All sampling, analysis, and QA/QC for this project was performed by Maxxam Analytics and complies with the Alberta Air Monitoring Directive.

Data contained in this monthly report has undergone the verification and validation based on the requirements of the AMD Chapter 6: Ambient Data Quality (December, 2016). The descriptions of the data verification and validation process can be found in Section 5 of this report. Instantaneous data, where applicable, is provided for reference purposes and has not undergone zero correction. The minimum and maximum statistics are highlighted in the data table and are for reference only. The highlighted cells are based on the software's interpretation of the exact position of the minimum or maximum value. The visual presentation of these statistics may not be the obvious choice in a data range due to rounding, truncating or analyzer specifications.

Hourly/minute data have been reviewed based on daily zero/span results and multi-point calibration results. Data may be considered invalid if a zero-corrected span check in excess of +/- 10% of the span concentration (established by the previous multi-point calibration) is encountered and/or significant differences in the calibration factor occurs (greater than 10%).

SULPHUR DIOXIDE (SO₂)

- Operational time, for the monitoring period, was 100%.
- The routine monthly calibration was performed on October 3.

HYDROGEN SULPHIDE (H₂S)

- Operational time, for the monitoring period, was 98.5%, equivalent to eleven hours of downtime.
- The routine monthly calibration was performed on October 3.
- An additional zero/span check was performed on October 7 at hour 06:00 in response to an elevated zero reading. The repeat check continued to exhibit an elevated zero reading, however it was still within AMD requirements. Zero readings dropped closer to the mean on October 8. One hour of downtime was recorded.
- The analyzer again exhibited a drift in zero response, within acceptance limits, on October 17. This prompted a site visit on October 18 where a repeat calibration was successfully completed. Five hours of downtime were recorded due to the additional calibration.
- It was observed, starting from October 23, that both the zero and span response were trending on the lower side of the mean. An additional zero-span check and a repeat calibration were completed on October 27 as extra quality assurance measures to verify analyzer performance. The success of the repeat calibration demonstrated that the analyzer was operating within AMD requirements. Five hours of downtime were recorded due to the additional quality checks.

TOTAL HYDROCARBONS (THC)

- Operational time, for the monitoring period, was 98.9%, equivalent to eight hours of downtime.
- The routine monthly calibration was performed on October 3.
- Instability in zero response was observed, starting from October 8. The drifts became wider on October 23. Scheduled and additional zero/span checks conducted between October 24 and October 26 confirmed the zero drift and that span results were outside the lower AMD acceptance limit. A site visit was scheduled and a successful repeat calibration was completed on October 26. Eight hours of downtime were recorded due to the additional quality checks.
- The calibrator zero obtained from the repeat calibration was applied for baseline correction on data collected from October 8 at hour 16:00 to October 26 at hour 12:00. Although the daily zero check results met the AMD requirements, they did show some instability. Calibrator zero was therefore applied for baseline correction on data. It was observed that the zero drifts correlated with shifts in Barometric Pressure recorded in the Cold Lake area at that time. However, the causal factors for this observation could not be determined and as such this is not a definitive conclusion.
- Some of the data recorded on October 17 exhibited a generally low trend. Corresponding minute data was reviewed and analyzer performance at that period was verified. It was observed that there was an increase in wind speed and a significant shift in wind direction during this period. There is no reason to consider the data invalid.
- The observed trends were consistent across the LICA network. Arrangements are being made to replace the analyzers for further off-site troubleshooting and maintenance.

OXIDES OF NITROGEN (NO_x), NITRIC OXIDE (NO) and NITROGEN DIOXIDE (NO₂)

- Operational time, for the monitoring period, was 94.1%, equivalent to forty-four hours of downtime.
- The routine monthly calibration was performed on October 3.
- Following a successful shut-down calibration and subsequent removal of the resident analyzer (Thermo, 42C s/n: 42CTL-65974-351) on October 18, LICA's analyzer (API 200E, s/n: 592) was installed after it had undergone manufacturer's maintenance. The analyzer was left in "Maintenance" mode overnight to stabilize and an installation calibration was completed on October 19. The installation calibration met all AMD requirements but barely passed at GPT low-point. The GPT component of the calibration was, therefore, repeated on October 20 as an extra quality assurance measure and the results were well within acceptance limits. Thirty-four hours of downtime were recorded due to this event.
- The analyzer spanned towards the lower acceptance limit on October 25. A repeat zero/span check was conducted on October 26 and the result exceeded the limit. This prompted an immediate site visit where a full repeat calibration was completed. An additional zero/span check was triggered on October 27 to provide a reference for updating the expected span value. As the repeat calibration met AMD requirements, no data was discarded due to this event. However, ten hours of downtime were recorded due to this event.

WIND SPEED (WS), WIND DIRECTION (WD) and STANDARD DEVIATION WIND DIRECTION (STDWD)

- Operational time, for the monitoring period, was 100%.
- Wind data is reported as vector wind speed and vector wind direction. Wind direction is defined as the direction from which the wind is blowing from and is measured in degrees from true north.

RELATIVE HUMIDITY (RH)

- Operational time, for the monitoring period, was 100%.

BAROMETRIC PRESSURE (BP)

- Operational time, for the monitoring period, was 100%.

PRECIPITATION (PRECIP)

- Operational time, for the monitoring period, was 100%.
- The precipitation sensor was audited on October 3. The results were satisfactory.

AMBIENT TEMPERATURE (AmbTPX)

- Operational time, for the monitoring period, was 100%.

2.0 Project Personnel

Mike Bisaga was the contact for Lakeland Industry & Community Association and the Maxxam field technician was Alexander Yakupov.

3.0 Plant Monthly Required AMD Summary

All data collected this month was compliant with the requirements outlined in the Air Monitoring Directive (Alberta Environment and Parks, 2016).

The operational time for all continuous ambient air analyzers, meteorological systems and data acquisition systems were above the 90% requirement.

4.0 Calculations and Results

All calculations and reporting of results follow the methods described in the AMD, 2016.

5.0 Methods and Procedures

The following methods and procedures were used to complete the monitoring program:

- Met One Instruments: Operation Manual Document No. 50.5-9800
- Maxxam AIR SOP-00209: Ambient Sulphur Monitoring
- Maxxam AIR SOP-00213: Ambient NO/NO₂/NO_x Monitoring
- Maxxam AIR SOP-00214: Ambient Hydrocarbon (THC) Monitoring
- Maxxam AIR SOP-00215: TEOM Operation
- Maxxam AIR SOP-00242: Precipitation Collector Installation/Maintenance

There were no deviations from the prescribed methods.

The following instruments were used to perform the test program:

- Sulphur Dioxide - API 100E UV Fluorescent Analyzer
- Hydrogen Sulphide - API 101E UV Fluorescent Analyzer
- Total Hydrocarbons - Thermo 51C FID Analyzer
- Oxides of Nitrogen - Thermo 42C and API 200E Chemiluminescent Analyzer
- Wind System - Met One Unit
- Relative Humidity - Met One Unit
- Barometric Pressure - Met One Unit
- Ambient Temperature - Met One Unit
- Precipitation - Met One Unit
- Datalogger - ESC 8832

The following steps were used to complete the data verification and validation process:

Level 0 Preliminary Verification

Level 0 data are raw data obtained directly from the data acquisition system (DAS). Under the step of Level 0, these data undergo a certain amount of manual or automated screening and flagging. It included a) identification of periods of missing data; b) verification of time stamps against reference time; c) verification that instrument diagnostics/datalogger flags indicate normal operation; d) comparison of data to upper and lower limits; e) rate of change flagging indicating that data changed too rapidly or not at all; and f) verification that zero, span and multipoint performance checks are within specifications. This level of verification is performed on a daily basis.

Level 1 Primary Validation

Validation actions under the step of Level 1 include a) review of all screening flags assigned during preliminary verification; b) review of all supporting site information and documentation; c) review of operational acceptance limits for each parameter/analyzer; d) review of daily zero/span and monthly calibration results for all gaseous parameters; and e) application of any necessary adjustments to data (e.g. baseline adjustments, below zero adjustments). This level of validation is performed on a monthly basis.

Level 2 Final Validation

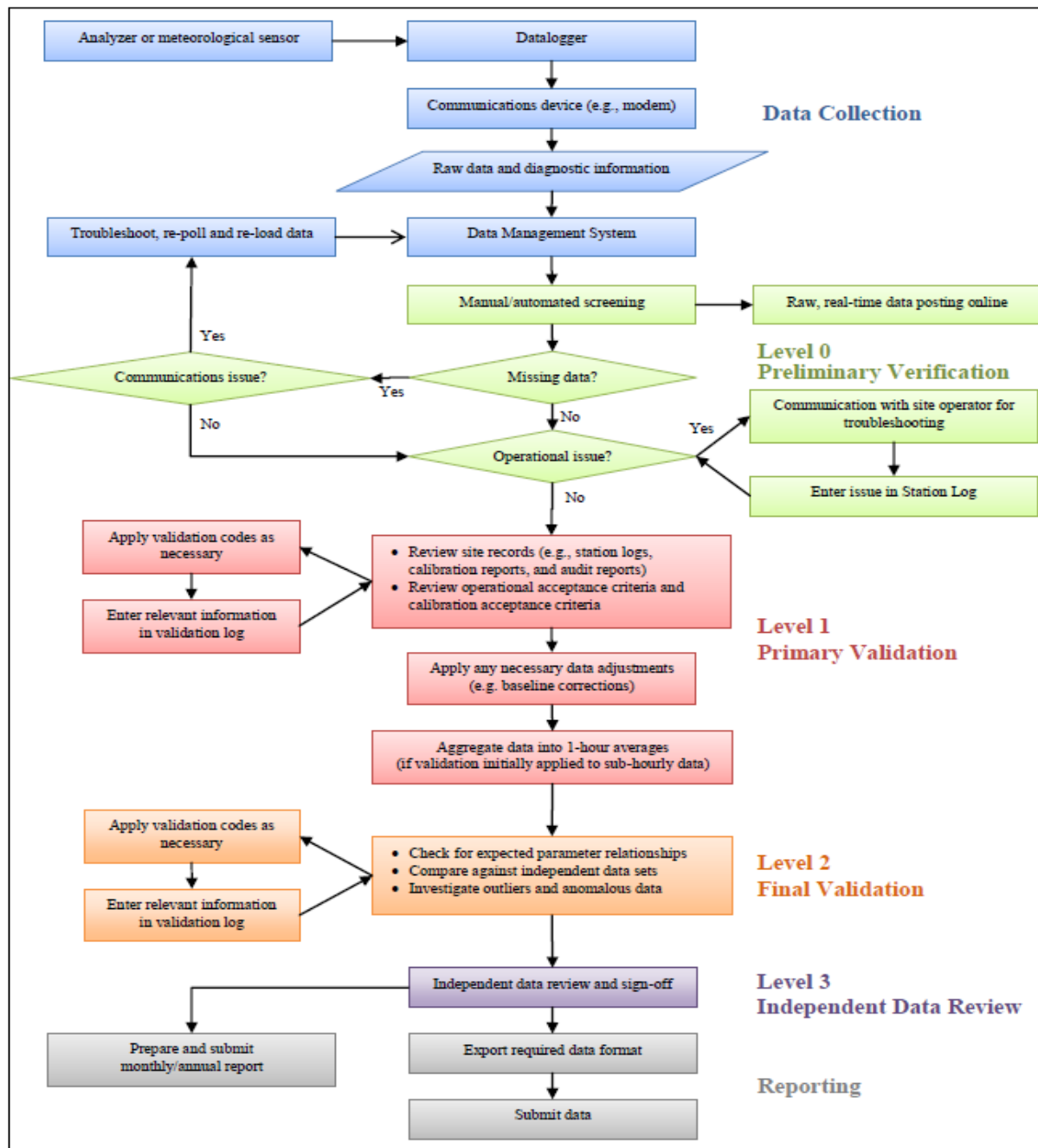
The purpose of Level 2 validation is to verify that there are no inconsistencies among related data, or among regional data measured at nearby sites.

Level 3 Independent Data Review

Level 3 validation is the last step of data review, and it is completed by an individual that is independent of both field operations and primary data validation. A final independent QA review and endorsement is performed during this step before data is submitted to Alberta Environment.

Post-Final Validation

The Post-Final Validation step serves to re-evaluate the data that errors or omissions are discovered and/or suspected after the initial submittal of data. Any data issues or patterns which were not clear on a monthly basis are highlighted during this step. This validation is performed on an annual basis.



Source: Air Monitoring Directive (December 2016), Chapter 6, Ambient Data Quality; Figure 1 Data Collection and Management Process Flow Chart

APPENDIX I
CONTINUOUS MONITORING DATA RESULTS

SULPHUR DIOXIDE

SULPHUR DIOXIDE Hourly Averages (SO₂ ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY																													
1	6	8	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	8	1	24	
2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	1	0	24	
3	1	1	1	2	3	3	2	3	10	10	C	C	C	C	C	0	0	0	0	0	0	S	1	0	0	10	2	24	
4	1	1	0	0	0	1	3	1	1	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	3	0	24	
5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	24	
6	0	0	0	0	0	0	0	0	0	1	2	1	0	0	0	0	0	S	0	0	0	0	0	0	0	2	0	24	
7	0	0	0	0	0	0	0	0	0	0	0	0	2	1	9	4	S	1	0	0	7	4	0	0	0	9	1	24	
8	1	2	0	0	3	2	3	4	1	0	0	1	2	2	S	3	3	0	1	0	0	1	0	0	0	4	1	24	
9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	24	
10	1	0	0	0	0	0	0	0	1	3	2	0	S	0	0	0	0	0	0	0	0	0	0	0	0	3	0	24	
11	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24	
12	0	0	0	0	0	0	0	0	0	0	0	S	3	1	6	4	5	3	0	0	0	0	0	0	0	6	1	24	
13	0	1	1	2	2	6	1	0	0	1	S	1	0	0	0	0	0	0	0	0	0	0	0	0	0	6	1	24	
14	0	0	0	0	0	0	0	0	0	0	S	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	24	
15	0	0	0	0	0	0	0	0	0	S	0	0	0	0	1	0	0	0	0	0	1	1	2	2	0	2	0	24	
16	2	0	2	1	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	24	
17	0	0	0	0	0	0	S	0	0	0	1	1	2	2	3	2	2	2	5	5	5	5	2	1	0	5	2	24	
18	0	0	0	0	0	S	1	0	0	4	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	4	0	24	
19	0	0	0	0	S	0	0	0	0	0	2	2	0	1	0	0	0	0	1	0	0	0	0	0	0	2	0	24	
20	0	0	0	S	0	0	0	0	0	0	0	1	2	2	2	3	1	0	0	2	4	1	1	4	0	4	1	24	
21	6	4	S	2	17	3	2	2	4	10	7	7	5	6	2	4	0	0	0	0	0	0	0	0	0	17	4	24	
22	0	S	0	0	0	0	0	0	0	0	1	1	1	2	5	2	1	1	1	0	0	0	0	0	0	5	1	24	
23	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	S	0	1	0	24	
24	0	0	0	0	0	0	0	1	1	0	1	2	4	3	11	4	6	13	6	0	0	0	S	0	0	13	2	24	
25	0	1	1	0	1	5	3	1	1	1	1	1	1	1	1	0	0	0	0	0	0	S	0	0	0	5	1	24	
26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	S	1	0	1	0	1	0	24	
27	0	0	1	0	0	0	0	0	0	1	1	3	2	1	0	0	0	0	1	S	0	0	0	0	0	3	0	24	
28	0	1	1	2	4	3	1	1	1	4	3	1	0	0	0	0	0	0	0	S	17	9	4	12	12	0	17	3	24
29	4	6	13	13	1	7	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	13	2	24	
30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24	
31	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	S	1	0	0	0	0	0	0	0	0	1	0	24	
HOURLY MAX	6	8	13	13	17	6	7	3	10	10	7	7	5	6	11	4	6	13	6	17	9	5	12	12					
HOURLY AVG	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1					

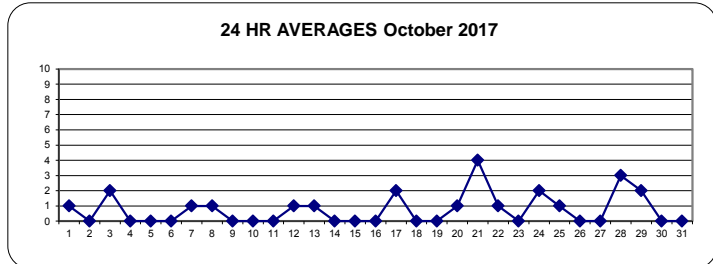
STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT:	1-HR	172	ppb	24-HR	48	ppb
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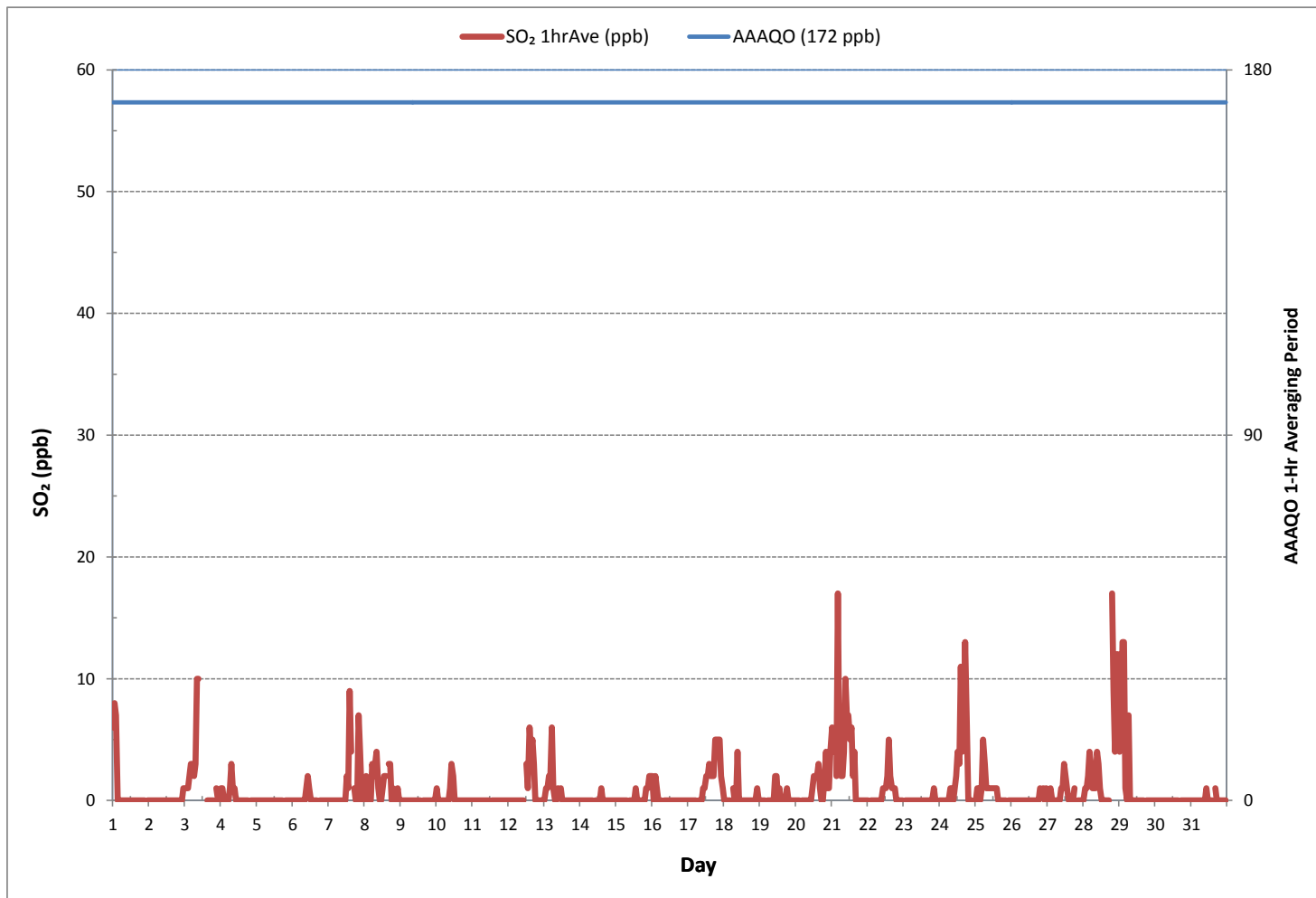
24 HR AVERAGES October 2017



MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0
NUMBER OF 24-HR EXCEEDANCES:	0
NUMBER OF NON-ZERO READINGS:	187
MINIMUM 1-HR AVERAGE:	0 ppb @ HOUR 3 ON DAY 1
MAXIMUM 1-HR AVERAGE:	17 ppb @ HOUR 4 ON DAY 21
MAXIMUM 24-HR AVERAGE:	4 ppb ON DAY 21
IZS CALIBRATION TIME:	32 hrs
OPERATIONAL TIME:	744 hrs
MONTHLY CALIBRATION TIME:	5 hrs
AMD OPERATION UPTIME:	100.0 %
STANDARD DEVIATION:	2
MONTHLY AVERAGE:	1 ppb

SULPHUR DIOXIDE Hourly Averages (SO₂ ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Maskwa Continuous Monitoring Station - October 2017

SULPHUR DIOXIDE Instantaneous Maximum (SO₂ ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.	
DAY 1	19	22	25	5	5	6	6	5	6	5	4	4	4	4	4	4	4	4	4	4	4	4	S	4	4	25	7	24
2	4	4	4	4	4	4	4	4	3	3	3	3	3	3	3	3	3	3	3	3	3	S	3	4	3	4	3	24
3	4	3	3	10	8	7	4	6	30	30	C	C	C	C	C	1	1	1	1	1	S	2	2	2	1	30	6	24
4	2	2	2	2	2	2	4	8	5	2	2	2	4	2	2	2	2	2	2	S	1	2	2	1	1	8	2	24
5	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	S	3	3	3	3	3	3	1	3	2	24
6	3	3	3	3	3	3	3	4	4	5	7	6	4	4	4	4	S	4	4	5	5	4	4	3	7	4	4	24
7	4	5	5	5	5	4	4	4	4	4	4	4	9	7	18	16	S	8	4	4	20	20	4	4	4	20	7	24
8	10	13	5	6	5	11	15	12	9	6	5	3	6	11	12	S	12	9	5	6	3	3	4	3	3	15	8	24
9	2	2	2	2	2	3	2	3	3	3	3	3	3	4	S	3	3	3	3	3	3	3	3	3	2	4	3	24
10	4	3	3	3	3	3	2	3	3	5	7	5	3	S	3	3	3	2	2	2	3	2	3	3	2	7	3	24
11	3	3	3	3	3	3	3	3	3	3	3	3	S	3	3	3	3	3	3	3	3	3	3	3	3	3	3	24
12	3	3	3	3	3	3	3	3	3	3	3	S	16	15	15	14	17	13	3	3	2	2	2	2	2	17	6	24
13	3	3	4	5	6	13	5	2	2	6	S	7	4	3	4	2	3	2	2	2	2	2	2	2	2	13	4	24
14	2	2	3	2	2	2	3	3	S	3	3	3	3	3	4	3	4	4	3	3	3	3	3	3	2	4	3	24
15	3	3	3	3	2	3	3	S	3	3	3	3	3	4	3	3	3	3	4	4	5	7	7	5	2	7	4	24
16	6	4	7	5	4	4	3	S	3	3	3	3	3	4	4	4	4	4	4	4	4	4	4	4	3	7	4	24
17	4	4	4	4	4	4	S	4	5	5	6	6	9	7	8	7	7	6	16	12	15	15	7	5	4	16	7	24
18	4	4	4	5	4	S	6	5	5	19	9	4	5	4	4	4	4	4	4	4	4	6	6	6	4	19	5	24
19	5	5	5	5	S	5	5	5	5	6	12	15	5	6	5	5	5	5	9	6	5	5	5	5	5	15	6	24
20	5	5	5	S	5	5	5	5	5	5	5	7	10	8	7	16	5	5	5	12	14	11	7	17	5	17	8	24
21	15	17	S	24	30	14	8	7	13	24	17	22	18	15	15	17	4	4	4	4	4	4	4	4	4	30	13	24
22	4	S	4	5	4	4	4	4	4	5	6	5	5	8	14	7	6	7	6	4	4	4	4	4	4	14	5	24
23	S	3	3	3	3	3	3	3	3	3	3	3	2	2	2	2	2	2	2	2	5	4	2	S	2	5	3	24
24	3	3	3	3	3	3	4	4	4	3	5	12	18	17	24	18	24	24	30	3	3	3	S	3	3	30	9	24
25	5	6	4	4	6	10	8	5	4	4	4	4	4	4	4	3	3	3	3	3	2	S	2	2	2	10	4	24
26	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	3	3	3	3	4	S	5	3	4	2	5	3	24
27	3	3	4	3	3	3	3	3	3	5	5	9	6	5	3	3	3	3	5	S	3	3	4	4	3	9	4	24
28	4	4	4	6	8	7	6	4	5	9	11	5	4	5	5	5	4	6	S	27	24	23	24	24	4	27	10	24
29	18	18	20	21	13	4	23	4	3	3	3	3	3	3	3	3	2	S	2	2	2	2	2	4	2	23	7	24
30	4	3	4	3	3	2	3	3	3	3	3	4	3	3	3	4	S	4	4	4	4	4	4	4	2	4	3	24
31	4	4	4	4	4	4	5	5	5	6	7	5	5	5	5	S	9	6	6	7	7	5	5	5	4	9	5	24
HOURLY MAX	19	22	25	24	30	14	23	12	30	30	17	22	18	17	24	18	24	24	30	27	24	23	24	24				
HOURLY AVG	5	5	5	5	5	5	5	4	5	6	5	5	6	6	6	6	5	5	5	5	6	5	4	5				

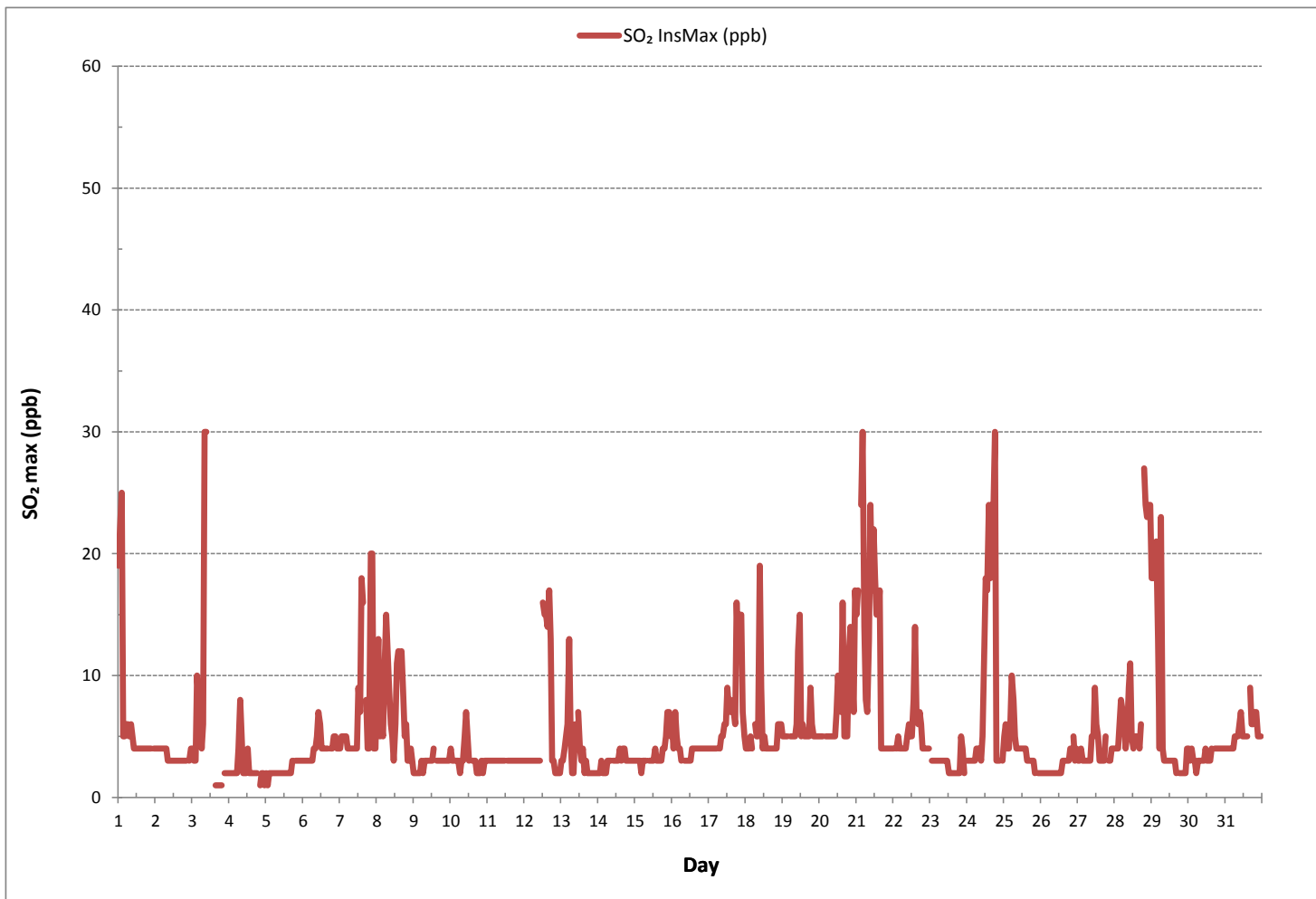
STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	707
MAXIMUM INSTANTANEOUS VALUE:	30 ppb @ HOUR 8 ON DAY 3
IZS CALIBRATION TIME:	32 hrs
MONTHLY CALIBRATION TIME:	5 hrs
STANDARD DEVIATION:	5
OPERATIONAL TIME:	744 hrs

SULPHUR DIOXIDE Instantaneous Maximum (SO₂ ppb)



Wind: LICA MASKWA
 Poll.: LICA MASKWA-SO₂[ppb]
 Monthly: 17/10
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

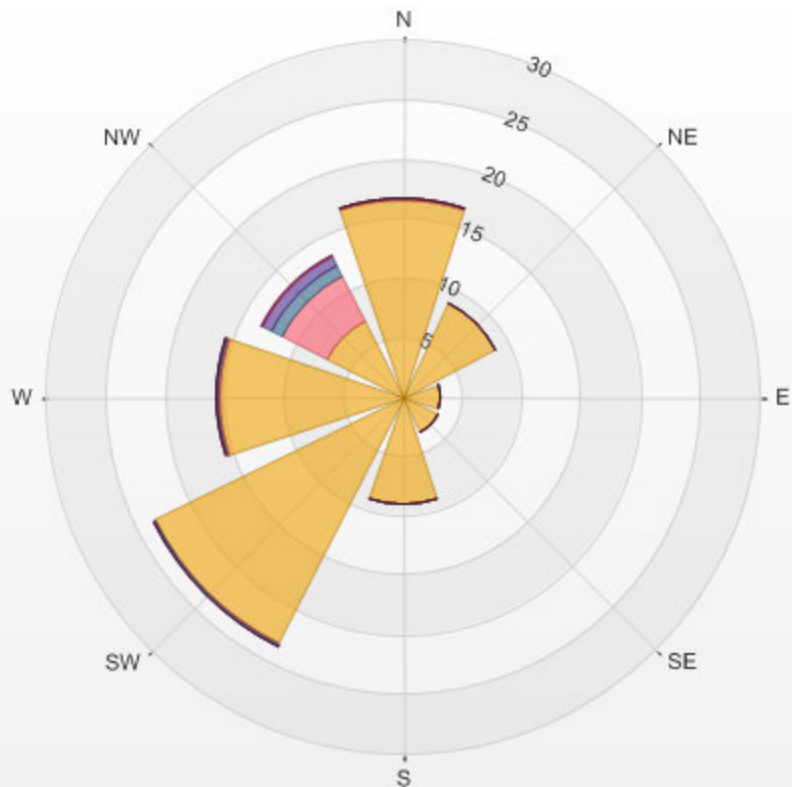
Calm: 6.22%

Calm Avg: 0.23 [ppb]

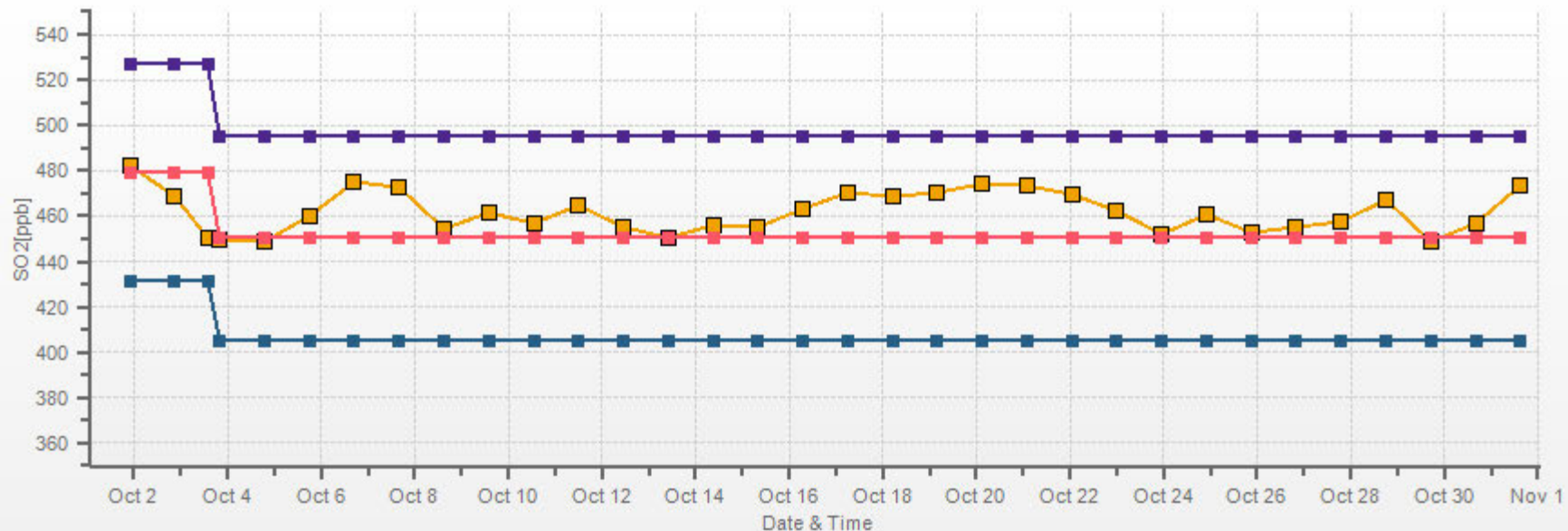
Direction	0.0-3.6	3.6-7.2	7.2-10.8	10.8-14.4	14.4-18.0	>18.0	Total
N	16.6	0.1	0.0	0.0	0.0	0.0	16.7
NE	8.8	0.0	0.0	0.0	0.0	0.0	8.8
E	3.1	0.1	0.0	0.0	0.0	0.0	3.3
SE	3.4	0.0	0.0	0.0	0.0	0.0	3.4
S	9.1	0.0	0.0	0.0	0.0	0.0	9.1
SW	23.2	0.1	0.1	0.0	0.0	0.0	23.5
W	15.4	0.1	0.1	0.0	0.0	0.0	15.7
NW	7.2	4.1	1.0	0.9	0.3	0.0	13.4
Summary	86.7	4.7	1.3	0.9	0.3	0.0	93.8

%	Icon	Classes (ppb)	87	5	1	1	0	0
		0.0-3.6						
		3.6-7.2						
		7.2-10.8						
		10.8-14.4						
		14.4-18.0						
		>18.0						

LICA MASKWA Poll.: LICA MASKWA-SO2[ppb] 2017/10/01 00:00 - 2017/10/31 23:00 Calm: 6.22% Calm Poll Avg: 0.23[ppb]



SO2[ppb] Calibration: LICA MASKWA Monthly: 17/10 Type: Span



■ Span Meas
 ■ Span Ref
 ■ Span Low
 ■ Span High

HYDROGEN SULPHIDE

HYDROGEN SULPHIDE Hourly Averages (H₂S ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.	
DAY																												
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	24
2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	24
3	0	0	0	0	0	0	0	0	0	0	C	C	C	C	C	0	0	0	0	0	0	S	0	0	0	0	0	24
4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	24
5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	24
6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	24
7	0	0	0	0	0	0	S1	0	0	0	0	0	0	1	1	0	S	0	0	0	0	0	0	0	0	1	0	23
8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	24
9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	24
10	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	24
11	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	24
12	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	24
13	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	24
14	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	24
15	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	24
16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
19	0	0	0	0	0	0	S	0	0	0	1	1	1	1	C1	C1	C1	C1	C1	0	0	0	1	1	0	1	0	19
20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
23	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	19
28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
29	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24
HOURLY MAX	0	0	1	1	1	1	1	1	1	1	1	1	1	1	2	1	2	2	1	1	2	1	1	1				
HOURLY AVG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				

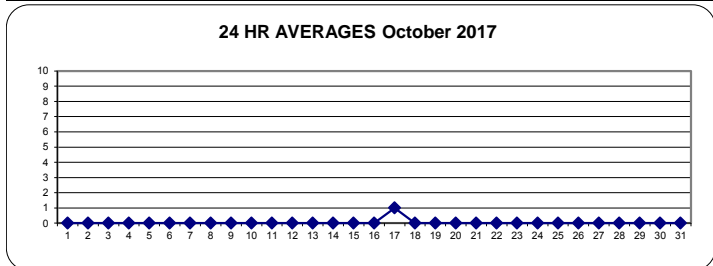
STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT:	1-HR	10	ppb	24-HR	3	ppb
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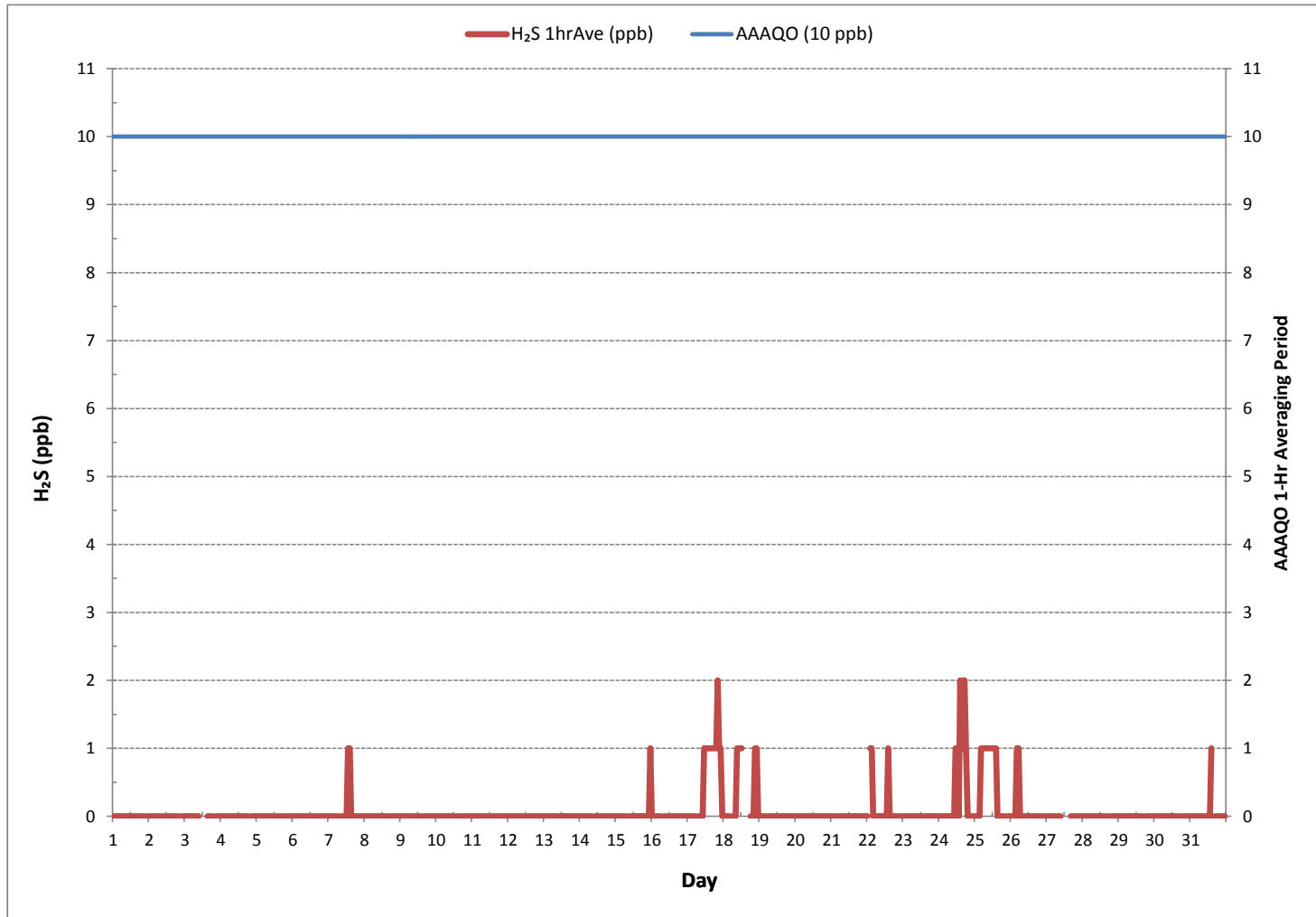
24 HR AVERAGES October 2017



MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0				
NUMBER OF 24-HR EXCEEDANCES:	0				
NUMBER OF NON-ZERO READINGS:	45				
MINIMUM 1-HR AVERAGE:	0 ppb @ HOUR	0	ON DAY	1	
MAXIMUM 1-HR AVERAGE:	2 ppb @ HOUR	20	ON DAY	17	
MAXIMUM 24-HR AVERAGE:	1 ppb		ON DAY	17	
IZS CALIBRATION TIME:	32	hrs	OPERATIONAL TIME:	733	hrs
MONTHLY CALIBRATION TIME:	5	hrs	AMD OPERATION UPTIME:	98.5	%
STANDARD DEVIATION:	0		MONTHLY AVERAGE:	0	ppb

HYDROGEN SULPHIDE Hourly Averages (H₂S ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Maskwa Continuous Monitoring Station - October 2017

HYDROGEN SULPHIDE Instantaneous Maximum (H₂S ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY 1	2	2	2	2	2	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	S	2	2	3	2	24	
2	3	1	2	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	S	1	1	1	3	1	24	
3	1	1	1	1	1	1	1	1	1	1	C	C	C	C	C	1	1	1	1	1	1	S	1	1	1	1	1	24	
4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	S	1	1	1	1	1	2	1	24	
5	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	S	2	2	2	2	2	2	1	2	24	
6	2	2	2	2	2	2	2	2	2	2	2	3	2	2	2	2	3	S	3	3	3	3	3	3	2	3	2	24	
7	3	3	3	3	3	3	S1	S1	3	3	3	3	3	3	3	2	S	2	3	2	3	3	2	2	2	3	3	22	
8	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	S	2	1	1	1	1	1	1	1	1	2	1	24	
9	2	1	1	1	1	1	1	1	2	2	1	2	2	2	S	2	2	2	2	2	2	2	2	2	2	1	2	24	
10	1	1	1	1	2	1	1	2	2	2	2	2	1	S	1	1	1	1	1	1	1	1	2	1	2	1	2	24	
11	1	2	1	2	2	2	3	2	2	2	2	2	S	2	2	2	4	2	2	2	2	2	2	2	2	1	4	24	
12	2	2	1	2	2	1	1	1	1	1	1	S	1	1	1	2	2	2	2	1	1	1	1	1	1	1	2	1	24
13	1	1	1	1	1	1	1	2	1	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	24
14	1	1	1	1	1	1	1	1	1	S	2	2	2	2	2	2	2	2	2	2	2	2	1	1	1	1	2	1	24
15	1	1	1	1	1	1	1	1	1	S	1	1	1	2	1	2	2	2	2	2	2	3	2	2	2	1	3	2	24
16	2	2	2	2	2	2	2	S	2	2	2	2	2	2	2	2	2	2	2	2	2	3	3	3	3	2	3	2	24
17	2	2	2	3	3	3	S	3	3	3	3	4	4	4	3	4	4	3	3	S	5	5	4	3	3	2	5	3	24
18	3	3	2	2	2	S	3	2	2	3	2	2	C1	C1	C1	C1	C1	0	1	1	4	3	2	0	4	2	0	19	
19	2	1	1	1	S	1	1	1	1	1	1	1	1	1	1	1	3	2	3	1	1	1	1	1	1	3	1	24	
20	1	1	1	S	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	24
21	1	1	S	1	1	1	1	0	1	1	1	1	1	0	0	1	1	0	0	0	0	0	1	1	1	0	1	1	24
22	1	S	3	2	1	1	1	1	1	1	1	1	1	1	1	0	1	0	0	0	0	0	0	0	0	3	1	24	
23	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	24	
24	0	0	0	0	0	0	0	0	0	0	0	1	2	2	1	4	2	2	5	5	0	0	0	S	0	0	5	1	24
25	0	0	0	0	0	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	1	0	24
26	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	1	0	24	
27	0	0	0	0	0	0	0	0	0	0	S1	0	C1	C1	C1	C1	1	1	1	S	1	1	1	2	0	2	0	19	
28	1	2	2	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	S	2	2	2	2	2	2	1	3	2	24
29	1	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	S	0	0	0	0	0	0	1	0	2	1	24
30	0	1	1	0	1	1	1	1	1	1	1	1	1	2	1	1	S	1	1	1	1	1	1	1	2	0	2	1	24
31	2	2	2	2	2	2	2	2	2	2	2	2	2	2	4	S	2	2	2	2	2	2	2	2	2	2	4	2	24
HOURLY MAX	3	3	3	3	3	3	3	3	3	3	3	4	4	4	4	4	4	5	5	5	5	5	4	3	3				
HOURLY AVG	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	2	2	1	1	1	1	1	1	1				

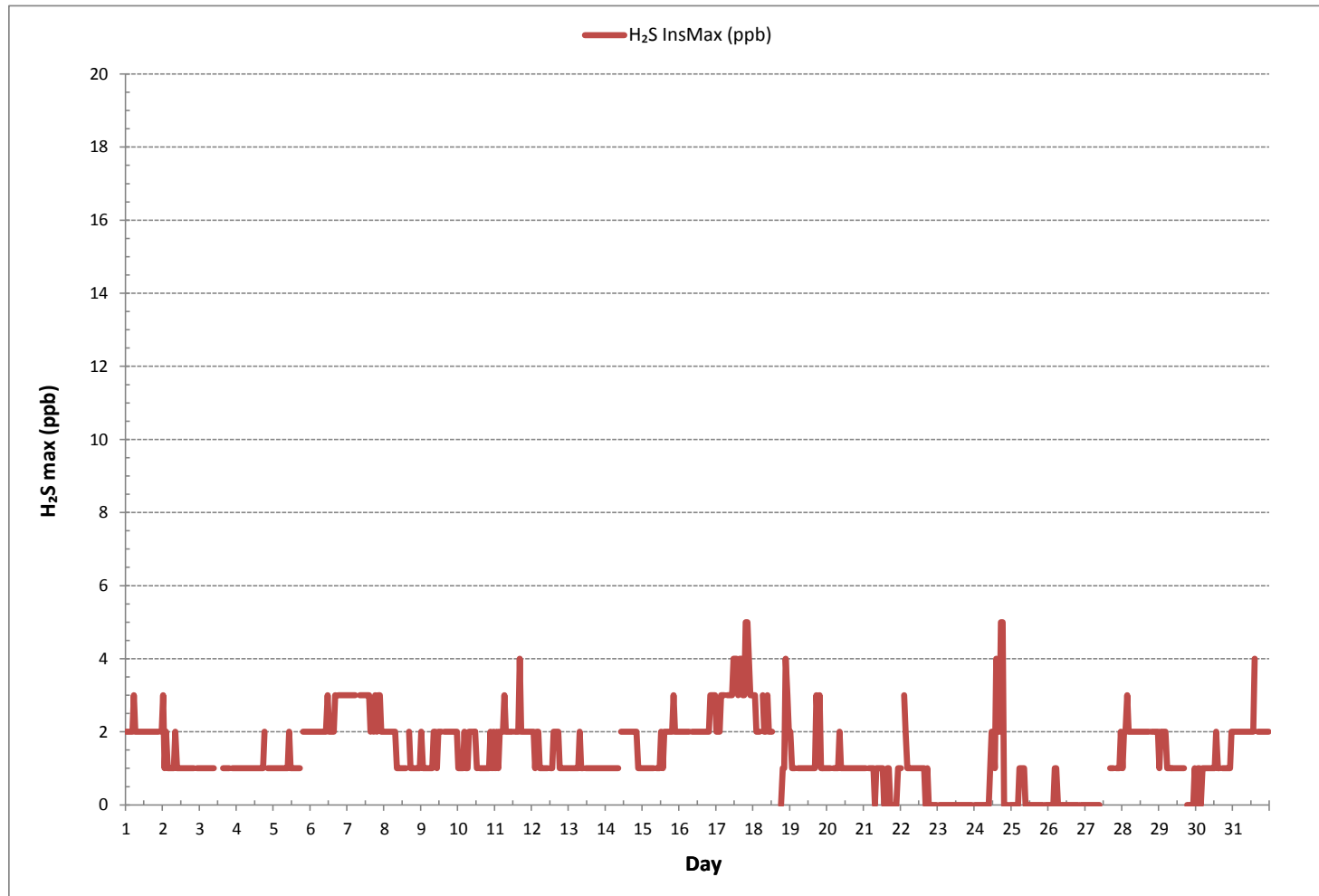
STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	585
MAXIMUM INSTANTANEOUS VALUE:	5 ppb @ HOUR 19 ON DAY 17
IZS CALIBRATION TIME:	32 hrs
MONTHLY CALIBRATION TIME:	5 hrs
OPERATIONAL TIME:	732 hrs
STANDARD DEVIATION:	1

HYDROGEN SULPHIDE Instantaneous Maximum (H₂S ppb)



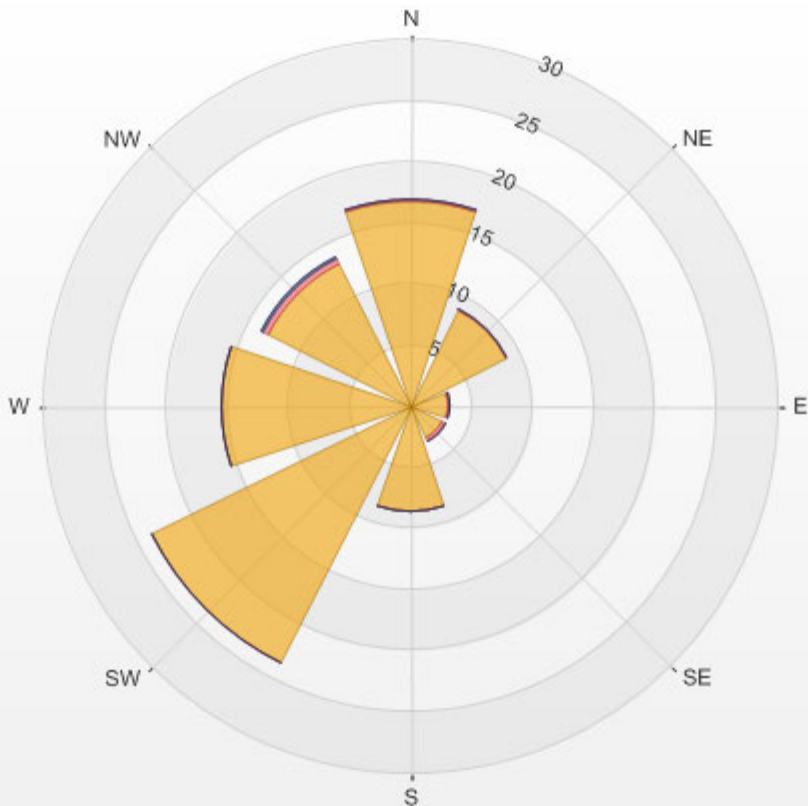
Wind: LICA MASKWA
 Poll.: LICA MASKWA-H₂S[ppb]
 Monthly: 17/10
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 6.18% Calm Avg: 0.07 [ppb]

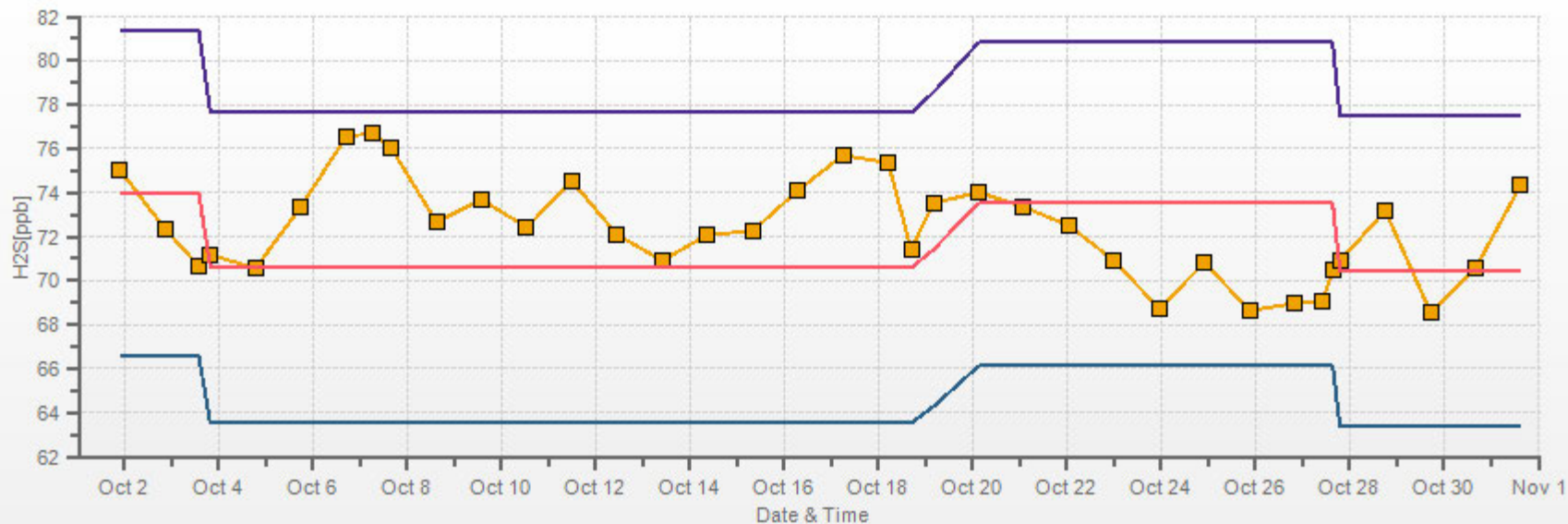
Direction	0.0-1.0	1.0-2.0	2.0-3.0	>3.0	Total
N	16.8	0.1	0.0	0.0	17.0
NE	8.8	0.1	0.0	0.0	8.9
E	3.2	0.1	0.0	0.0	3.3
SE	3.0	0.3	0.0	0.0	3.3
S	8.6	0.0	0.0	0.0	8.6
SW	23.6	0.0	0.0	0.0	23.6
W	15.5	0.0	0.0	0.0	15.5
NW	12.9	0.6	0.1	0.0	13.6
Summary	92.4	1.3	0.1	0.0	93.8

% Icon Classes (ppb) 92 0.0-1.0 1 1.0-2.0 0 2.0-3.0 0 >3.0

LICA MASKWA Poll.: LICA MASKWA-H2S[ppb] 2017/10/01 00:00 - 2017/10/31 23:00 Calm: 6.18% Calm Poll Avg: 0.07[ppb]



H2S[ppb] Calibration: LICA MASKWA Monthly: 17/10 Type: Span



Span Meas Span Ref Span Low Span High

TOTAL HYDROCARBON



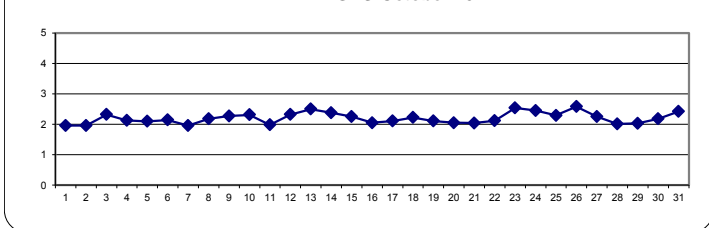
TOTAL HYDROCARBONS Hourly Averages (THC ppm)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.		
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.			
DAY																														
1	1.94	1.94	1.93	1.90	1.90	1.89	1.87	1.88	1.92	1.98	2.00	1.99	2.01	2.01	2.01	1.99	2.00	2.00	2.01	2.02	2.02	2.03	S	1.95	1.87	2.03	1.96	24		
2	1.95	1.94	1.95	1.96	1.94	1.95	1.94	1.93	1.95	1.94	1.96	1.93	1.94	1.94	1.93	1.92	1.88	1.92	1.98	2.03	S	2.09	2.13	1.88	2.13	1.96	24			
3	2.16	2.19	2.23	2.27	2.32	2.39	2.44	2.50	2.54	2.65	2.41	2.52	2.49	2.42	C	C	C	C	2.08	2.09	S	2.08	2.12	2.13	2.08	2.65	2.32	24		
4	2.18	2.27	2.31	2.31	2.26	2.24	2.26	2.29	2.19	2.13	2.10	2.01	2.02	2.03	2.02	2.03	1.99	2.01	2.05	S	2.03	2.09	2.17	2.09	1.99	2.31	2.13	24		
5	2.10	2.22	2.19	2.15	2.17	2.16	2.15	2.21	2.19	2.28	2.18	2.06	2.05	2.05	2.04	2.04	2.02	2.00	S	1.96	1.94	1.99	2.06	2.05	1.94	2.28	2.10	24		
6	2.03	2.01	2.01	2.01	2.01	2.00	1.99	2.02	2.36	2.33	2.23	2.18	2.23	2.23	2.21	2.20	2.21	S	2.19	2.24	2.25	2.21	2.12	2.00	1.99	2.36	2.14	24		
7	1.99	1.97	1.97	1.93	1.95	1.92	1.92	1.91	1.91	1.90	1.91	1.92	1.94	2.17	2.05	1.96	S	1.99	1.88	1.87	2.21	2.10	1.84	1.87	1.84	2.21	1.96	24		
8	1.91	1.95	1.97	2.00	2.04	2.11	2.13	2.12	2.15	2.11	2.08	2.06	2.04	2.09	2.13	S	2.42	2.48	2.33	2.39	2.34	2.36	2.59	2.41	1.91	2.59	2.18	24		
9	2.35	2.36	2.34	2.38	2.41	2.35	2.37	2.40	2.46	2.50	2.58	2.47	2.30	2.09	S	2.02	2.03	2.01	2.00	1.97	2.06	2.12	2.23	2.32	1.97	2.58	2.27	24		
10	2.37	2.36	2.32	2.32	2.34	2.47	2.86	2.61	2.55	2.53	2.51	2.43	2.19	S	2.14	2.14	2.15	2.16	2.15	2.13	2.10	2.09	2.06	2.05	2.05	2.86	2.31	24		
11	2.05	2.03	2.00	1.99	1.99	1.99	2.00	2.00	1.97	1.96	S	1.95	1.96	S	1.95	1.94	1.93	1.94	1.92	1.95	1.98	2.01	2.01	2.03	1.92	2.05	1.98	24		
12	2.06	2.10	2.12	2.17	2.22	2.25	2.25	2.26	2.27	2.27	2.30	S	2.29	2.31	2.46	2.47	2.66	2.82	2.31	2.31	2.33	2.33	2.36	2.38	2.06	2.82	2.32	24		
13	2.39	2.42	2.42	2.44	2.44	2.55	2.44	2.45	2.48	2.50	S	2.54	2.55	2.58	2.54	2.52	2.52	2.51	2.50	2.56	2.56	2.56	2.59	2.55	2.39	2.59	2.50	24		
14	2.56	2.60	2.63	2.59	2.56	2.58	2.62	2.66	2.70	S	2.60	2.52	2.35	2.27	2.20	2.18	2.12	2.16	2.15	2.11	2.10	2.11	2.16	2.20	2.10	2.70	2.38	24		
15	2.25	2.26	2.29	2.39	2.46	2.49	2.45	2.56	S	2.38	2.39	2.26	2.13	2.11	2.09	2.08	2.09	2.12	2.11	2.14	2.14	2.15	2.16	2.18	2.08	2.56	2.25	24		
16	2.16	2.12	2.17	2.12	2.01	2.00	2.02	S	2.01	2.03	2.06	2.01	1.96	2.01	2.04	2.07	2.09	2.12	2.07	2.01	2.01	2.02	1.99	1.99	1.96	2.17	2.05	24		
17	1.96	2.10	2.14	2.20	2.22	2.28	S	2.29	2.30	2.30	2.12	1.96	1.92	1.83	1.78	1.75	1.85	1.88	1.77	1.88	1.77	1.88	3.11	2.86	2.11	1.87	1.75	3.11	2.11	24
18	1.80	2.02	2.01	2.03	1.93	S	3.04	2.23	2.37	2.69	2.45	2.22	2.40	2.18	2.17	2.15	2.23	2.20	2.12	2.18	2.20	2.19	2.16	2.12	1.80	3.04	2.22	24		
19	2.13	2.12	2.12	2.09	S	2.05	2.07	2.08	2.16	2.12	2.09	2.03	2.07	2.09	2.07	2.07	2.16	2.21	2.15	2.15	2.12	2.12	2.09	2.09	2.03	2.21	2.11	24		
20	2.07	2.05	2.06	S	2.11	2.16	2.19	2.19	2.17	2.13	1.98	2.03	2.03	1.99	1.89	1.81	1.77	1.81	2.79	2.44	1.86	1.87	1.89	1.77	2.79	2.05	24			
21	1.91	1.91	S	1.90	1.99	2.02	2.05	2.09	2.11	2.04	1.98	1.90	1.92	1.92	1.94	1.98	1.93	1.95	2.13	2.24	2.29	2.28	2.21	2.31	1.90	2.31	2.04	24		
22	2.33	S	2.20	2.17	2.11	2.06	2.04	2.01	2.00	1.98	1.99	1.97	1.88	1.91	1.97	2.08	2.30	2.25	2.20	2.20	2.23	2.30	2.32	2.31	1.88	2.33	2.12	24		
23	S	2.32	2.37	2.39	2.40	2.44	2.46	2.48	2.54	2.56	2.51	2.43	2.44	2.48	2.51	2.54	2.52	2.58	2.68	2.81	2.82	2.87	2.82	S	2.32	2.87	2.54	24		
24	2.76	2.75	2.81	2.82	2.76	2.71	S1	S1	2.44	2.20	2.22	2.21	2.21	2.22	2.46	2.38	2.42	2.42	2.35	2.29	2.34	2.31	S	2.28	2.20	2.82	2.45	22		
25	2.28	2.28	2.25	2.24	2.17	2.21	2.11	2.06	2.06	2.08	2.08	2.10	2.15	2.22	2.26	2.33	2.40	2.44	2.49	2.54	2.59	S	2.65	2.71	2.06	2.71	2.29	24		
26	2.72	2.74	2.80	2.78	2.84	2.77	2.82	S1	2.77	2.76	2.71	2.69	2.67	C1	C1	C1	C1	C1	2.00	2.02	S	2.21	2.24	2.28	2.00	2.84	2.58	18		
27	2.32	2.28	2.20	2.18	2.32	2.40	2.43	2.37	2.31	2.28	2.26	2.18	2.11	2.19	2.09	2.08	2.19	2.09	2.09	S	2.33	2.38	2.33	2.30	2.08	2.43	2.25	24		
28	2.27	2.20	2.14	2.22	2.30	2.25	2.02	1.88	1.88	1.89	1.83	1.81	1.82	1.90	1.93	1.95	1.94	1.98	S	1.98	1.98	1.95	2.02	2.05	1.81	2.30	2.01	24		
29	2.02	2.05	2.09	2.07	2.00	1.98	1.97	1.94	1.95	1.95	1.95	2.00	2.01	2.04	2.03	2.00	2.00	S	2.05	2.08	2.10	2.14	2.17	2.18	1.94	2.18	2.03	24		
30	2.17	2.16	2.17	2.22	2.21	2.22	2.26	2.26	2.16	2.12	2.14	2.10	2.10	2.11	2.08	2.07	S	2.09	2.15	2.21	2.20	2.23	2.32	2.38	2.07	2.38	2.18	24		
31	2.47	2.52	2.59	2.68	2.68	2.69	2.65	2.72	2.80	2.80	2.82	2.80	2.59	2.46	2.41	S	2.16	2.08	2.04	1.98	1.97	1.96	1.95	1.92	1.92	2.82	2.42	24		
HOURLY MAX	2.76	2.75	2.81	2.82	2.84	2.77	3.04	2.72	2.80	2.80	2.82	2.80	2.67	2.58	2.54	2.54	2.66	2.82	2.79	2.81	3.11	2.87	2.82	2.71						
HOURLY AVG	2.19	2.21	2.23	2.23	2.24	2.25	2.27	2.23	2.26	2.25	2.21	2.18	2.16	2.13	2.12	2.10	2.15	2.15	2.16	2.16	2.22	2.20	2.20	2.17						

STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

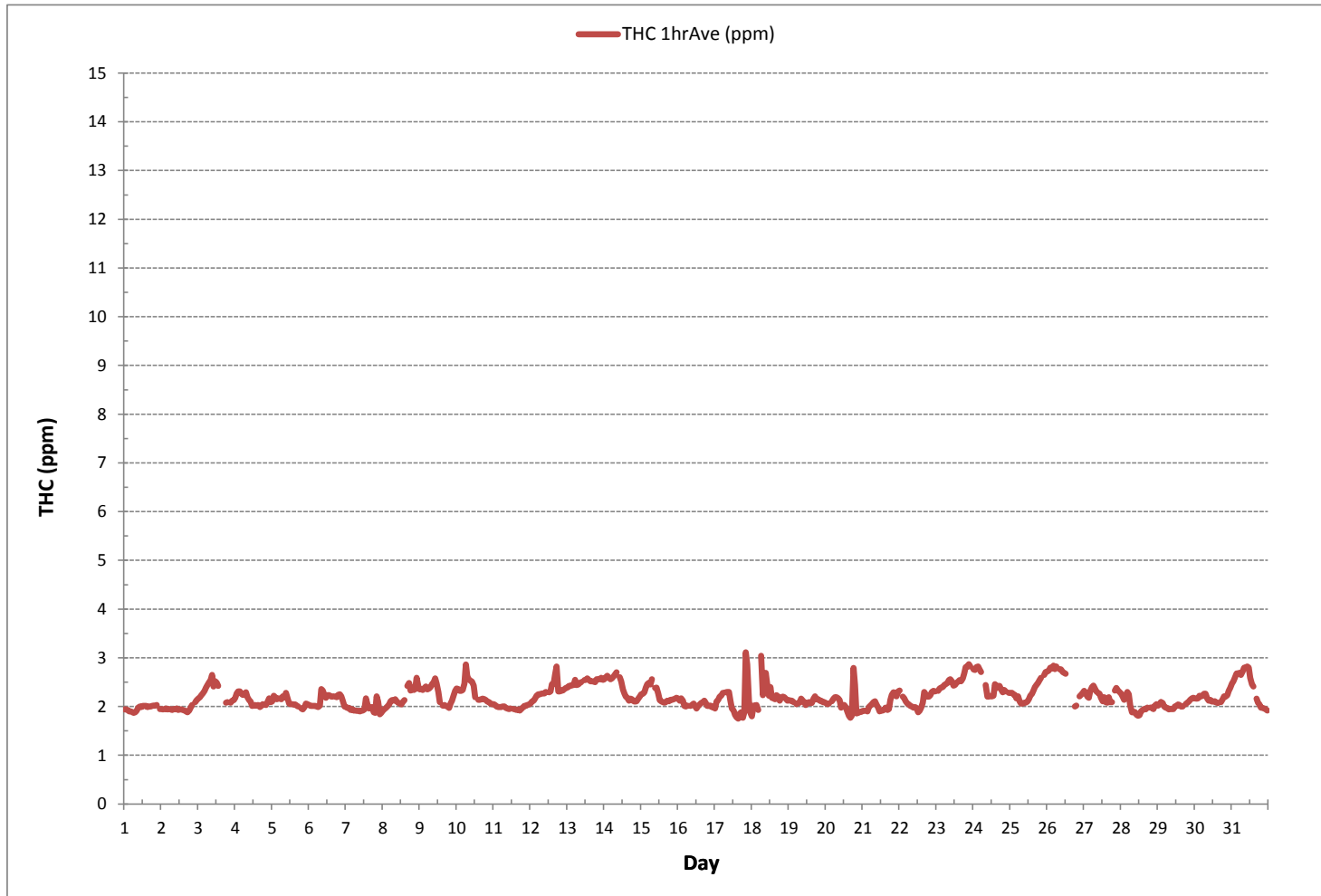
24 HR AVERAGES October 2017



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	700			
MINIMUM 1-HR AVERAGE:	1.75 ppm	@ HOUR	15	ON DAY 17
MAXIMUM 1-HR AVERAGE:	3.11 ppm	@ HOUR	20	ON DAY 17
MAXIMUM 24-HR AVERAGE:	2.58 ppm			ON DAY 26
IZS CALIBRATION TIME:	32 hrs	OPERATIONAL TIME:	736 hrs	
MONTHLY CALIBRATION TIME:	4 hrs	AMD OPERATION UPTIME:	98.9 %	
STANDARD DEVIATION:	0.24	MONTHLY AVERAGE:	2.20 ppm	

TOTAL HYDROCARBONS Hourly Averages (THC ppm)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Maskwa Continuous Monitoring Station - October 2017

TOTAL HYDROCARBONS Instantaneous Maximum (THC ppm)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY MIN.	DAILY MAX.	24-HR AVG.	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59				
DAY 1	1.92	2.00	2.00	1.91	1.92	1.91	1.89	1.95	2.00	2.06	2.09	2.09	2.12	2.14	2.13	2.13	2.15	2.15	2.18	2.19	2.21	2.21	S	2.18	1.89	2.21	2.07	24
2	2.19	2.21	2.24	2.24	2.27	2.27	2.27	2.30	2.33	2.33	2.37	2.36	2.40	2.40	2.40	2.41	2.41	2.40	2.47	2.55	2.61	S	2.62	2.64	2.19	2.64	2.38	24
3	2.64	2.64	2.64	2.68	2.70	2.74	2.76	2.83	3.07	3.08	2.64	2.71	2.71	2.56	C	C	C	C	2.12	2.03	S	2.06	2.09	2.09	2.03	3.08	2.57	24
4	2.18	2.27	2.31	2.31	2.28	2.27	2.30	2.36	2.27	2.17	2.19	2.09	2.12	2.11	2.12	2.12	2.11	2.15	2.18	S	2.14	2.21	2.30	2.19	2.09	2.36	2.21	24
5	2.18	2.33	2.29	2.18	2.18	2.17	2.15	2.18	2.15	2.28	2.27	2.00	1.97	1.97	1.94	1.93	1.90	1.87	S	1.83	1.81	1.86	1.96	1.96	1.81	2.33	2.06	24
6	1.90	1.90	1.88	1.90	1.91	1.90	1.87	2.21	2.29	2.27	2.17	2.11	2.16	2.18	2.14	2.12	2.14	S	2.15	2.19	2.19	2.18	2.12	2.00	1.87	2.29	2.08	24
7	1.99	1.96	1.96	1.92	1.96	1.91	1.90	1.90	1.91	1.91	1.93	1.95	2.08	3.92	2.95	2.36	S	2.83	1.97	2.00	3.71	3.74	2.00	2.06	1.90	3.29	2.30	24
8	2.16	2.37	2.22	2.27	2.34	2.88	2.97	2.50	2.58	2.49	2.49	2.47	2.47	3.45	3.56	S	3.90	3.25	2.71	3.04	2.62	2.65	3.61	3.07	2.16	3.90	2.79	24
9	2.64	2.67	2.64	2.68	2.73	2.67	2.70	2.70	2.80	2.83	2.89	2.88	2.64	2.47	S	2.31	2.33	2.31	2.31	2.26	2.39	2.46	2.53	2.65	2.26	2.89	2.59	24
10	2.67	2.67	2.64	2.64	2.65	3.36	3.61	3.25	2.97	3.45	3.19	3.00	2.49	S	2.43	2.43	2.44	2.46	2.44	2.43	2.40	2.40	2.36	2.36	2.36	3.61	2.73	24
11	2.36	2.33	2.33	2.30	2.30	2.29	2.30	2.31	2.28	2.26	2.26	2.26	S	2.26	2.25	2.24	2.27	2.21	2.24	2.27	2.28	2.30	2.31	2.33	2.21	2.36	2.28	24
12	2.36	2.40	2.42	2.46	2.52	2.53	2.55	2.55	2.57	2.58	2.59	S	2.59	2.73	3.60	3.46	4.41	4.62	2.61	2.61	2.65	2.64	2.67	2.70	2.36	4.62	2.82	24
13	2.70	2.71	2.71	2.73	2.80	3.25	2.74	2.76	2.80	2.83	S	2.94	2.88	2.89	2.85	2.82	2.82	2.80	2.82	2.86	2.86	2.86	2.91	2.86	2.70	3.25	2.83	24
14	2.88	2.94	2.95	2.89	2.86	2.91	2.93	2.97	3.01	S	2.93	2.85	2.71	2.58	2.50	2.49	2.43	2.47	2.46	2.43	2.39	2.40	2.44	2.49	2.39	3.01	2.69	24
15	2.55	2.55	2.62	2.70	2.76	2.81	2.76	2.93	S	2.70	2.70	2.61	2.46	2.42	2.39	2.37	2.40	2.42	2.40	2.44	2.46	2.46	2.47	2.49	2.37	2.93	2.56	24
16	2.47	2.43	2.53	2.50	2.33	2.30	2.32	S	2.32	2.33	2.36	2.32	2.26	2.30	2.34	2.36	2.37	2.42	2.40	2.31	2.31	2.33	2.30	2.26	2.53	2.36	2.24	24
17	2.27	2.67	2.52	2.55	2.52	2.62	S	2.74	2.59	2.59	2.52	2.26	2.24	2.14	2.09	2.06	2.16	2.21	2.09	3.63	5.08	4.18	3.37	2.52	2.06	5.08	2.68	24
18	2.76	2.98	2.86	3.13	2.43	S	4.15	3.84	3.61	3.61	3.86	3.11	3.75	2.49	2.76	2.46	2.58	2.58	2.43	2.48	2.49	2.46	2.45	2.42	2.42	4.15	2.94	24
19	2.40	2.40	2.40	2.36	S	2.36	2.36	2.39	2.46	2.40	2.40	2.36	2.40	2.39	2.39	2.43	2.54	2.52	2.49	2.50	2.42	2.40	2.37	2.36	2.36	2.54	2.41	24
20	2.35	2.33	2.42	S	2.40	2.45	2.47	2.47	2.48	2.49	2.30	2.36	2.33	2.30	2.22	2.12	2.06	2.11	4.01	4.18	2.15	2.15	2.18	2.18	2.06	4.18	2.46	24
21	2.18	2.18	S	2.24	2.30	2.33	2.33	2.39	2.42	2.37	2.30	2.21	2.22	2.22	2.24	2.40	2.24	2.27	2.55	2.57	2.79	2.98	2.50	2.76	2.18	2.98	2.39	24
22	2.67	S	2.49	2.49	2.43	2.40	2.34	2.32	2.31	2.27	2.27	2.30	2.18	2.21	2.28	2.46	2.73	2.55	2.49	2.49	2.52	2.61	2.61	2.18	2.18	2.73	2.44	24
23	S	2.64	2.67	2.70	2.73	2.74	2.76	2.80	2.85	2.85	2.85	2.73	2.76	2.80	2.82	2.85	2.83	2.92	2.98	3.42	3.16	3.21	3.16	S	2.64	3.42	2.87	24
24	3.08	3.08	3.15	3.12	3.08	3.01	S1	S1	2.83	2.55	2.64	2.67	2.70	2.56	2.92	2.83	2.83	2.89	2.88	2.58	2.65	2.62	S	2.55	2.55	3.15	2.82	22
25	2.59	2.61	2.53	2.53	2.49	2.55	2.46	2.36	2.37	2.39	2.39	2.43	2.49	2.52	2.59	2.65	2.71	2.76	2.83	2.86	2.89	S	2.95	3.03	2.36	3.03	2.61	24
26	3.03	3.05	3.15	3.12	3.19	3.11	3.21	S1	3.08	3.07	3.04	3.00	3.03	C1	C1	C1	C1	C1	2.09	2.09	S	2.27	2.33	2.35	2.09	3.21	2.84	18
27	2.37	2.34	2.27	2.27	2.45	2.46	2.52	2.49	2.42	2.36	2.34	2.32	2.22	2.28	2.21	2.35	2.35	2.14	2.18	S	2.37	2.40	2.33	2.30	2.14	2.52	2.34	24
28	2.24	2.15	2.08	2.15	2.18	2.15	2.03	1.69	1.69	1.72	1.68	1.56	1.59	1.68	1.68	1.66	1.62	1.66	S	1.72	1.75	1.72	1.84	1.90	1.56	2.24	1.83	24
29	1.87	1.91	2.03	2.02	1.93	1.94	1.97	1.94	1.97	2.00	2.05	2.12	2.12	2.20	2.20	2.21	2.23	S	2.27	2.27	2.30	2.33	2.33	2.36	1.87	2.36	2.11	24
30	2.34	2.30	2.33	2.36	2.33	2.35	2.36	2.36	2.30	2.20	2.21	2.15	2.15	2.15	2.11	2.09	S	2.09	2.12	2.18	2.12	2.15	2.24	2.35	2.09	2.36	2.23	24
31	2.43	2.52	2.46	2.49	2.47	2.45	2.45	2.43	2.52	2.52	2.49	2.47	2.32	2.09	2.02	S	1.81	1.72	1.72	1.68	1.69	1.69	1.68	1.66	1.66	2.52	2.16	24
HOURLY MAX	3.08	3.08	3.15	3.13	3.19	3.36	4.15	3.84	3.61	3.61	3.86	3.11	3.75	3.92	3.60	3.46	4.41	4.62	4.01	4.18	5.08	4.18	3.61	3.07				
HOURLY AVG	2.41	2.45	2.46	2.46	2.45	2.50	2.53	2.50	2.51	2.50	2.48	2.42	2.42	2.43	2.43	2.37	2.47	2.47	2.43	2.49	2.53	2.48	2.45	2.39				

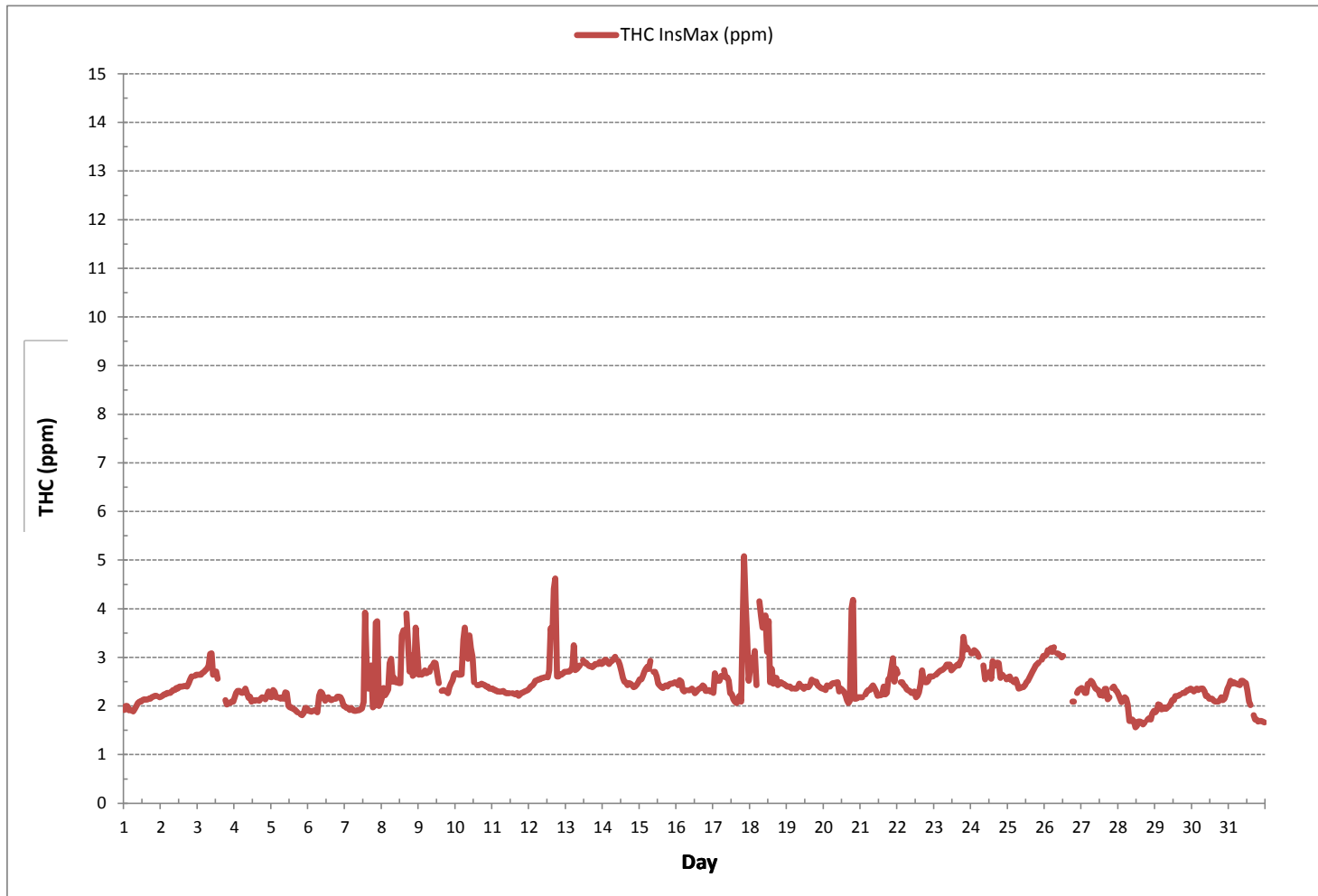
STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	700
MAXIMUM INSTANTANEOUS VALUE:	5.08 ppm @ HOUR 20 ON DAY 17
IZS CALIBRATION TIME:	32 hrs
MONTHLY CALIBRATION TIME:	4 hrs
OPERATIONAL TIME:	736 hrs
STANDARD DEVIATION:	0.43

TOTAL HYDROCARBONS Instantaneous Maximum (THC ppm)



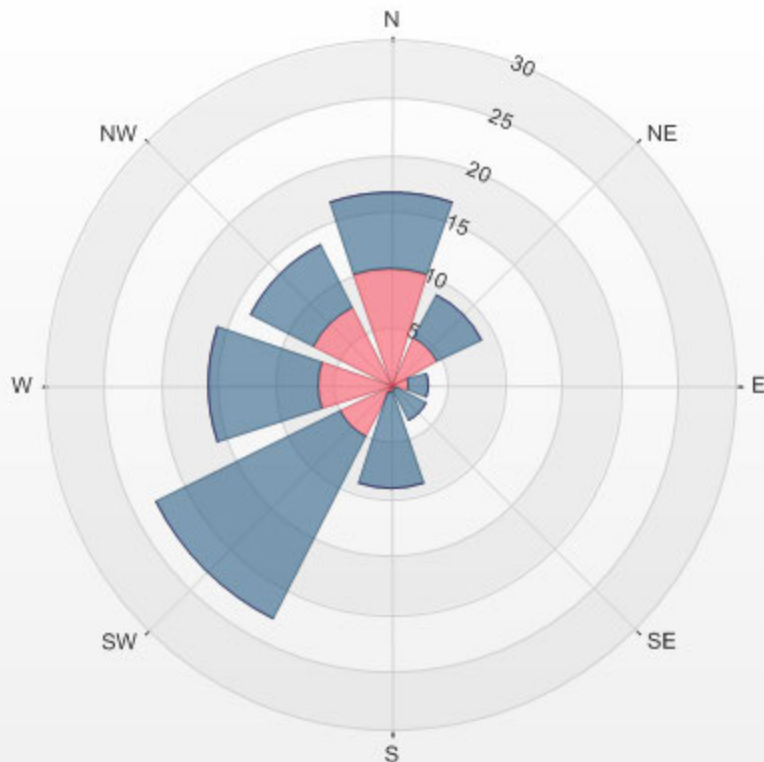
Wind: LICA MASKWA
 Poll.: LICA MASKWA-THC[ppm]
 Monthly: 17/10
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 6.29% Calm Avg: 2.32 [ppm]

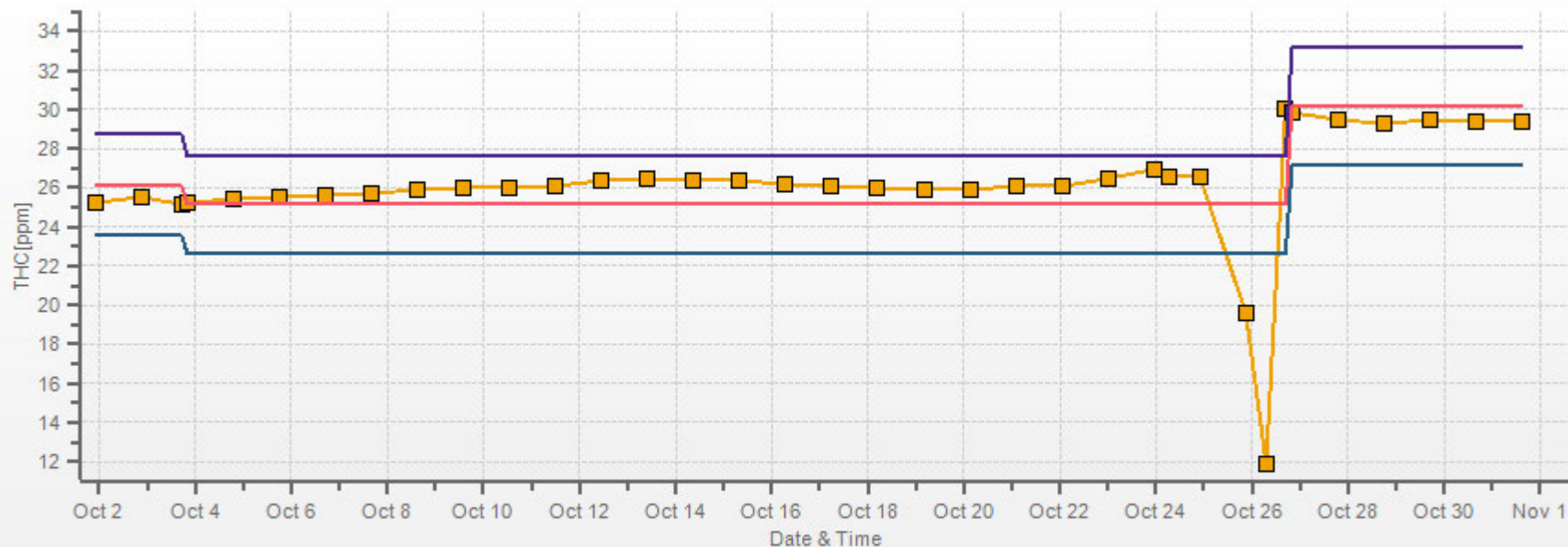
Direction	0.0-1.0	1.0-2.1	2.1-3.1	>3.1	Total
N	0.0	10.1	6.7	0.0	16.9
NE	0.0	4.6	4.3	0.0	8.9
E	0.0	1.6	1.7	0.0	3.3
SE	0.0	0.6	2.9	0.0	3.4
S	0.0	0.7	8.3	0.0	9.0
SW	0.0	5.0	17.9	0.0	22.9
W	0.0	6.4	9.4	0.0	15.9
NW	0.0	7.6	6.0	0.0	13.6
Summary	0.0	36.6	57.2	0.0	93.7

% Icon Classes (ppm) 0 0.0-1.0 37 1.0-2.1 57 2.1-3.1 0 >3.1

LICA MASKWA Poll.: LICA MASKWA-THC[ppm] 2017/10/01 00:00 - 2017/10/31 23:00 Calm: 6.29% Calm Poll Avg: 2.32[ppm]



THC[ppm] Calibration: LICA MASKWA Monthly: 17/10 Type: Span



Span Meas Span Ref Span Low Span High

OXIDES OF NITROGEN



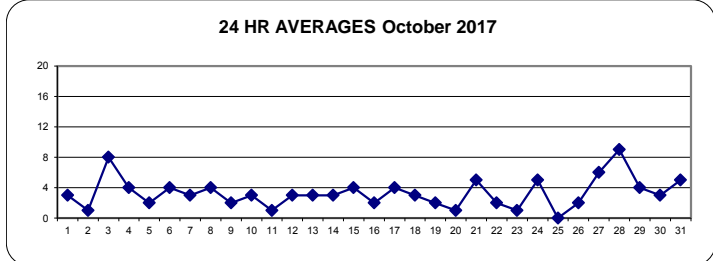
OXIDES OF NITROGEN Hourly Averages (NO_x ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY																													
1	14	17	14	1	1	1	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	1	1	S	2	0	17	3	24
2	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	2	2	S	3	5	0	5	1	24
3	5	4	4	8	7	11	11	13	17	24	C	C	C	C	C	C	C	1	1	1	1	S	7	4	5	1	24	8	24
4	6	9	6	5	9	5	14	13	4	3	2	2	2	1	1	1	0	1	2	S	1	1	2	2	2	0	14	4	24
5	2	2	2	2	2	2	3	3	3	5	4	3	1	1	1	1	1	1	S	3	2	2	2	2	2	1	5	2	24
6	2	2	3	3	3	4	4	4	5	5	7	5	3	4	4	5	5	S	6	5	6	6	6	3	1	1	7	4	24
7	1	1	0	0	1	1	0	0	0	0	1	2	7	5	19	7	S	4	0	0	15	6	1	0	0	0	19	3	24
8	3	5	1	1	0	6	4	6	8	2	2	1	3	4	5	S	7	8	2	4	2	2	4	2	0	0	8	4	24
9	1	1	1	2	3	1	2	3	3	3	4	4	4	2	S	1	0	0	0	1	1	1	1	2	6	0	6	2	24
10	7	4	2	1	1	2	2	9	15	11	10	6	1	S	2	1	0	0	0	0	0	0	0	0	0	0	15	3	24
11	1	1	1	1	1	1	1	1	1	1	1	1	1	S	1	1	1	1	1	1	1	0	0	0	0	0	1	1	24
12	0	0	1	2	2	2	3	2	2	2	2	2	S	6	3	10	7	8	6	1	1	1	1	1	1	0	10	3	24
13	1	2	2	2	3	9	2	1	2	3	S	3	2	2	3	2	2	2	1	3	3	2	4	3	1	1	9	3	24
14	2	4	4	3	2	4	4	5	5	S	5	5	4	4	5	4	3	4	3	2	1	1	1	2	1	1	5	3	24
15	2	1	2	4	2	3	3	6	S	3	4	3	3	3	2	2	2	3	3	4	4	6	8	8	1	1	8	4	24
16	7	3	9	4	1	1	1	S	2	1	1	1	1	1	2	1	1	1	1	1	1	2	1	1	1	1	9	2	24
17	1	1	1	1	1	4	S	3	3	4	5	3	5	4	5	3	3	5	11	7	7	7	3	1	1	1	11	4	24
18	0	1	2	1	0	S	10	5	3	9	3	1	1	C1	C1	C1	C1	C1	Y	Y	Y	Y	Y	Y	0	0	10	3	13
19	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	C1	C1	C1	C1	C1	C1	C1	6	2	1	1	0	0	0	0	6	2	6
20	0	0	0	S	0	0	0	0	0	0	0	C1	C1	C1	C1	C1	4	1	1	3	4	1	1	4	0	4	1	1	19
21	6	4	S	0	17	4	8	10	12	10	8	8	5	7	2	5	0	0	1	1	1	1	1	2	0	17	5	5	24
22	2	S	1	1	1	1	1	1	1	1	1	1	2	7	6	6	6	5	1	1	1	1	1	0	0	7	2	2	24
23	S	1	0	0	0	0	1	0	1	2	3	1	1	0	0	1	0	1	1	6	6	3	S	0	0	6	1	1	24
24	2	2	3	3	3	3	4	6	3	0	1	3	6	5	14	7	10	20	9	0	0	0	S	0	0	20	5	5	24
25	0	1	0	0	0	6	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	6	0	0	24
26	0	0	0	2	3	3	4	S1	3	2	1	0	0	C1	C1	C1	C1	C1	C1	C1	C1	5	4	6	0	6	2	15	
27	6	8	8	3	3	6	10	12	6	10	S1	11	8	8	4	3	2	2	3	S	3	3	3	4	2	12	6	23	
28	4	4	5	9	16	16	7	3	4	16	12	1	0	2	2	2	0	4	S	28	16	7	21	20	0	28	9	24	
29	7	10	22	21	1	0	13	0	0	0	0	1	1	0	0	1	0	S	1	1	1	1	1	2	0	22	4	24	
30	3	4	3	4	3	3	4	5	4	2	3	2	1	2	2	3	S	3	3	3	3	3	3	3	1	5	3	24	
31	2	2	10	14	14	12	11	8	7	8	8	6	4	3	3	S	2	1	1	1	1	0	0	0	0	0	14	5	24
HOURLY MAX	14	17	22	21	17	16	14	13	17	24	12	11	8	8	19	7	10	20	11	28	16	7	21	20					
HOURLY AVG	3	3	4	3	3	4	4	4	4	4	3	3	3	3	4	3	2	3	2	3	3	3	3	3	3				

STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

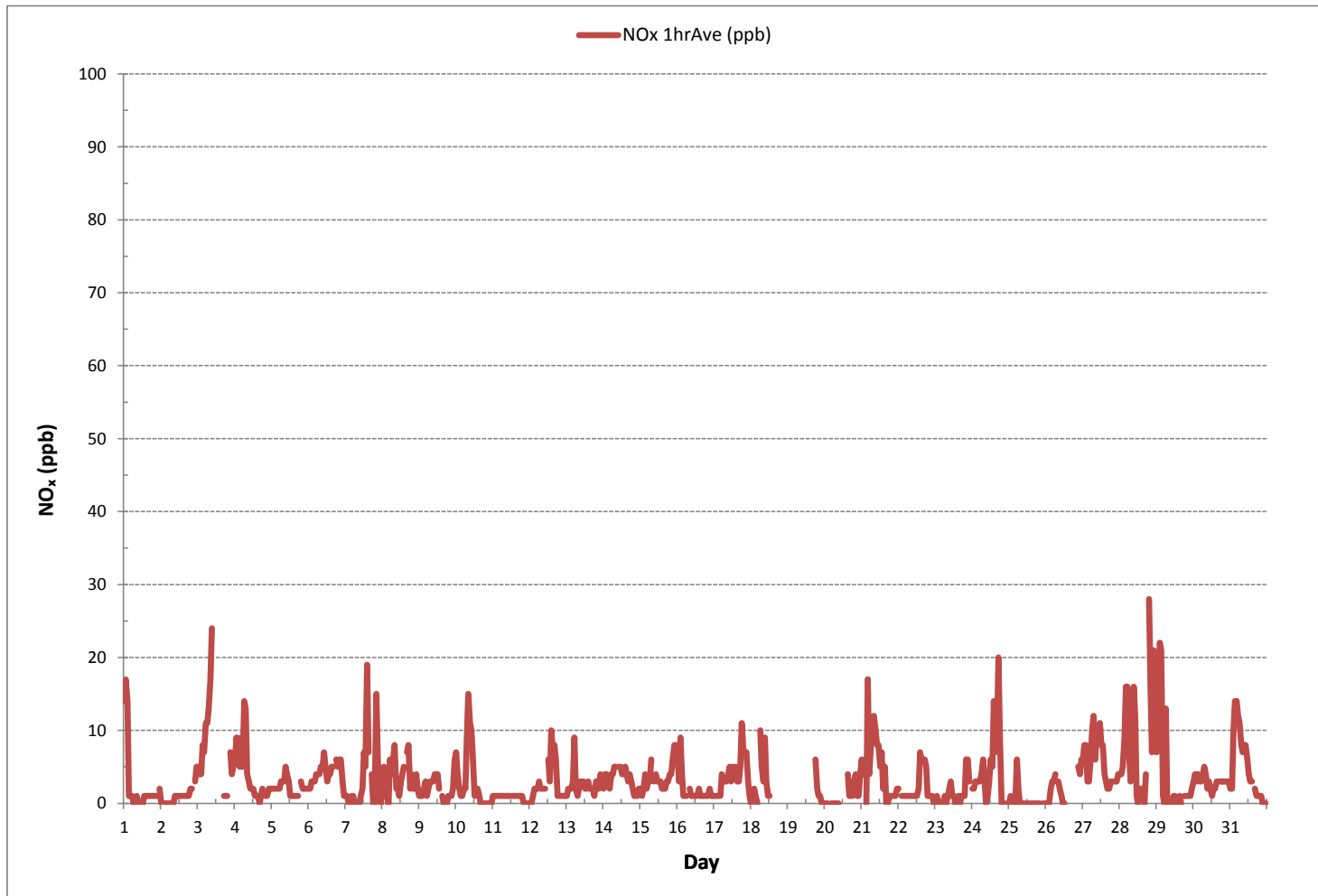
24 HR AVERAGES October 2017



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	552			
MINIMUM 1-HR AVERAGE:	0	ppb @ HOUR	6	ON DAY 1
MAXIMUM 1-HR AVERAGE:	28	ppb @ HOUR	19	ON DAY 28
MAXIMUM 24-HR AVERAGE:	9	ppb		ON DAY 28
IZS CALIBRATION TIME:	30	hrs	OPERATIONAL TIME:	700 hrs
MONTHLY CALIBRATION TIME:	7	hrs	AMD OPERATION UPTIME:	94.1 %
STANDARD DEVIATION:	4		MONTHLY AVERAGE:	3 ppb

OXIDES OF NITROGEN Hourly Averages (NO_x ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Maskwa Continuous Monitoring Station - October 2017

OXIDES OF NITROGEN Instantaneous Maximum (NO_x ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY 1	32	38	45	0	0	5	3	0	10	0	0	0	0	0	0	0	0	0	0	0	0	0	S	1	0	45	6	24	
2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	2	3	0	3	0	24	
3	3	2	4	19	16	15	15	18	53	47	C	C	C	C	C	C	C	2	10	1	S	8	6	8	1	53	14	24	
4	8	10	9	12	16	8	23	17	6	5	3	3	9	4	2	1	2	2	2	S	3	1	2	3	1	23	7	24	
5	2	3	3	2	2	3	10	5	4	6	5	4	6	2	1	4	1	1	S	3	2	2	2	2	1	10	3	24	
6	2	2	3	3	3	5	5	5	14	7	9	10	4	5	6	5	5	S	6	5	9	9	6	1	1	14	6	24	
7	1	1	1	2	2	1	0	1	1	1	10	10	18	10	32	22	S	11	1	0	37	31	1	1	0	37	8	24	
8	19	23	7	14	8	26	32	23	20	8	10	6	11	25	24	S	26	20	7	12	4	5	5	4	4	32	15	24	
9	2	1	0	2	4	2	4	4	4	4	5	6	4	3	S	2	1	1	0	1	1	2	3	8	0	8	3	24	
10	9	5	3	1	4	3	4	19	60	17	14	8	2	S	2	1	0	0	0	0	0	0	0	0	0	60	7	24	
11	0	0	0	0	0	0	0	0	0	0	0	0	S	1	0	1	1	1	0	0	0	0	0	0	0	1	0	24	
12	0	0	0	2	2	1	2	5	2	2	2	S	27	29	30	24	29	23	1	3	1	0	0	0	0	30	8	24	
13	1	1	1	2	8	17	3	4	1	13	S	7	7	8	11	3	3	4	1	2	5	2	4	5	1	17	5	24	
14	3	5	3	2	2	7	5	6	4	S	4	4	7	4	5	4	6	5	3	1	0	0	0	1	0	7	4	24	
15	1	1	4	5	2	3	4	7	S	4	4	4	2	10	3	1	3	3	4	3	4	9	10	8	1	10	4	24	
16	9	3	11	7	1	10	0	S	3	1	4	8	4	4	2	4	2	1	0	0	1	3	2	1	0	11	4	24	
17	0	0	0	0	0	21	S	7	2	4	6	4	11	4	6	4	9	6	24	14	18	21	5	3	0	24	7	24	
18	0	3	4	4	0	S	12	14	8	27	12	2	4	C1	C1	C1	C1	C1	Y	Y	Y	Y	Y	Y	0	27	8	13	
19	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	C1	C1	C1	C1	C1	C1	C1	13	6	3	2	2	1	1	13	5	6
20	1	2	1	S	1	1	1	1	1	1	C1	C1	C1	C1	C1	10	3	2	2	8	11	5	3	12	1	12	4	19	
21	11	11	S	19	24	11	13	13	18	15	13	17	15	11	8	12	0	0	0	0	0	0	0	1	0	24	9	24	
22	0	S	0	0	0	0	0	0	0	0	0	1	0	3	11	7	9	20	22	0	0	0	0	0	0	22	3	24	
23	S	0	0	0	0	0	6	0	0	4	3	2	0	1	0	0	0	0	0	1	8	6	3	S	0	8	2	24	
24	1	1	1	2	2	2	5	6	5	0	2	7	16	20	24	14	27	29	34	0	0	0	S	0	0	34	9	24	
25	0	1	0	0	1	9	3	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	S	0	0	9	1	24	
26	0	0	0	1	3	4	4	S1	5	2	0	0	0	C1	C1	C1	C1	C1	C1	C1	C1	7	4	6	0	7	2	15	
27	6	10	10	3	4	8	14	18	10	15	S1	13	9	9	5	2	2	1	4	S	3	3	3	4	1	18	7	23	
28	4	3	4	11	18	18	11	8	8	19	21	2	0	5	6	6	1	14	S	37	33	33	36	30	0	37	14	24	
29	22	23	29	31	18	1	34	0	0	0	1	0	0	0	0	0	0	S	1	1	1	0	0	4	0	34	7	24	
30	4	3	2	4	3	3	4	6	5	1	3	2	2	3	2	3	S	4	3	3	3	3	3	3	1	6	3	24	
31	3	4	15	18	19	15	14	9	7	9	9	6	5	3	3	S	3	2	2	3	2	1	0	0	0	19	7	24	
HOURLY MAX	32	38	45	31	24	26	34	23	60	47	21	17	27	29	32	24	29	29	34	37	37	37	33	36	30				
HOURLY AVG	5	5	6	6	5	7	8	7	9	7	5	5	6	7	7	5	5	6	5	4	5	5	4	4					

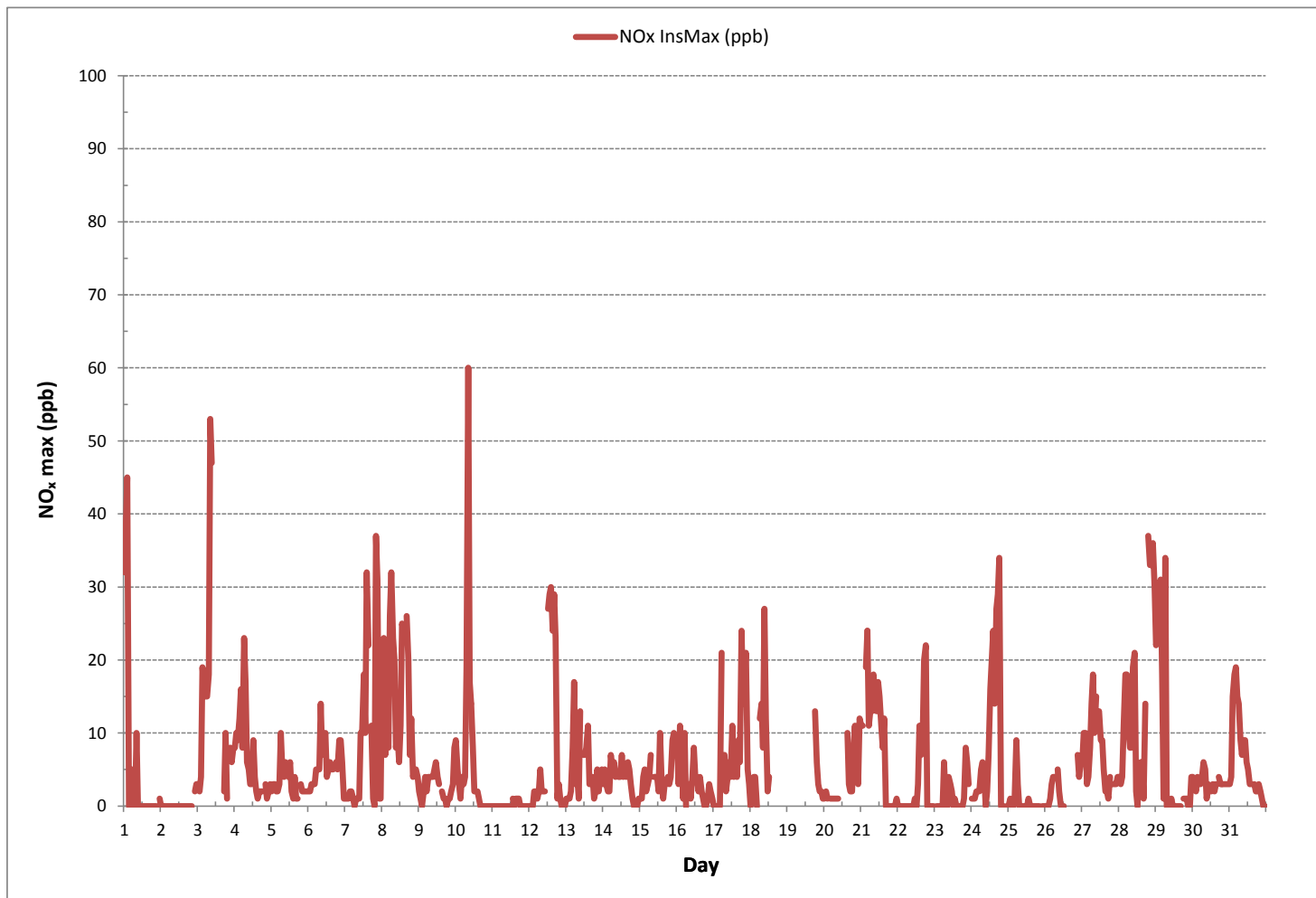
STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	497
MAXIMUM INSTANTANEOUS VALUE:	60 ppb @ HOUR 8 ON DAY 10
IZS CALIBRATION TIME:	30 hrs
MONTHLY CALIBRATION TIME:	7 hrs
STANDARD DEVIATION:	8
OPERATIONAL TIME:	700 hrs

OXIDES OF NITROGEN Instantaneous Maximum (NO_x ppb)



Wind: LICA MASKWA
 Poll.: LICA MASKWA-NO_x[ppb]
 Monthly: 17/10
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 6.03% Calm Avg: 3.78 [ppb]

Direction	0.0-9.7	9.7-19.3	19.3-29.0	>29.0	Total
N	17.2	0.2	0.0	0.0	17.3
NE	9.2	0.0	0.0	0.0	9.2
E	3.3	0.0	0.0	0.0	3.3
SE	1.5	0.0	0.0	0.0	1.5
S	8.9	0.2	0.0	0.0	9.1
SW	21.9	1.1	0.2	0.0	23.1
W	15.1	1.2	0.0	0.0	16.3
NW	11.0	2.3	0.9	0.0	14.2
Summary	88.1	4.8	1.1	0.0	94.0

% Icon Classes (ppb)

88



0.0-9.7

5



9.7-19.3

1



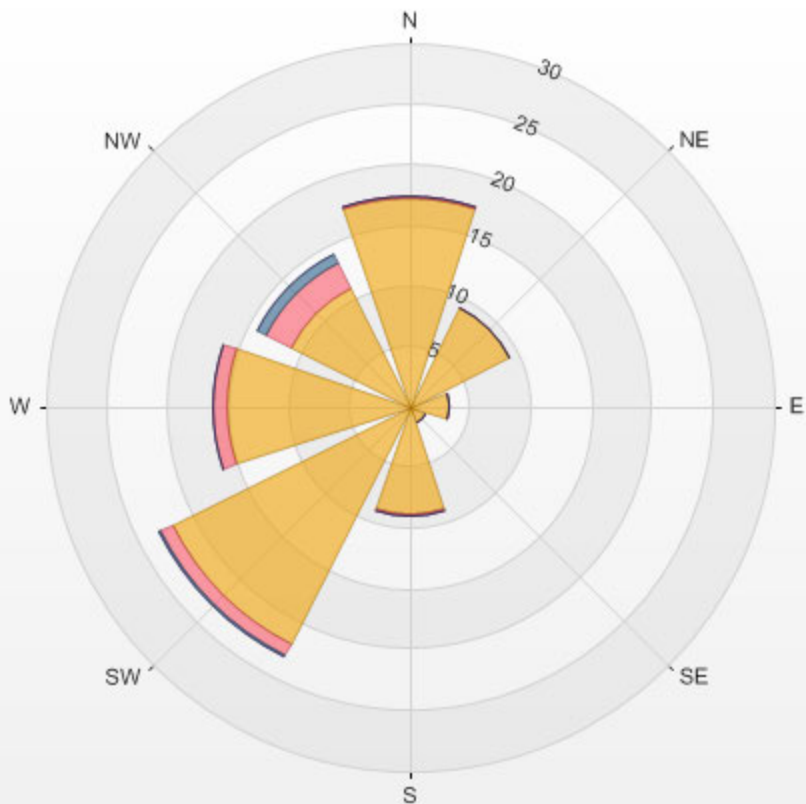
19.3-29.0

0

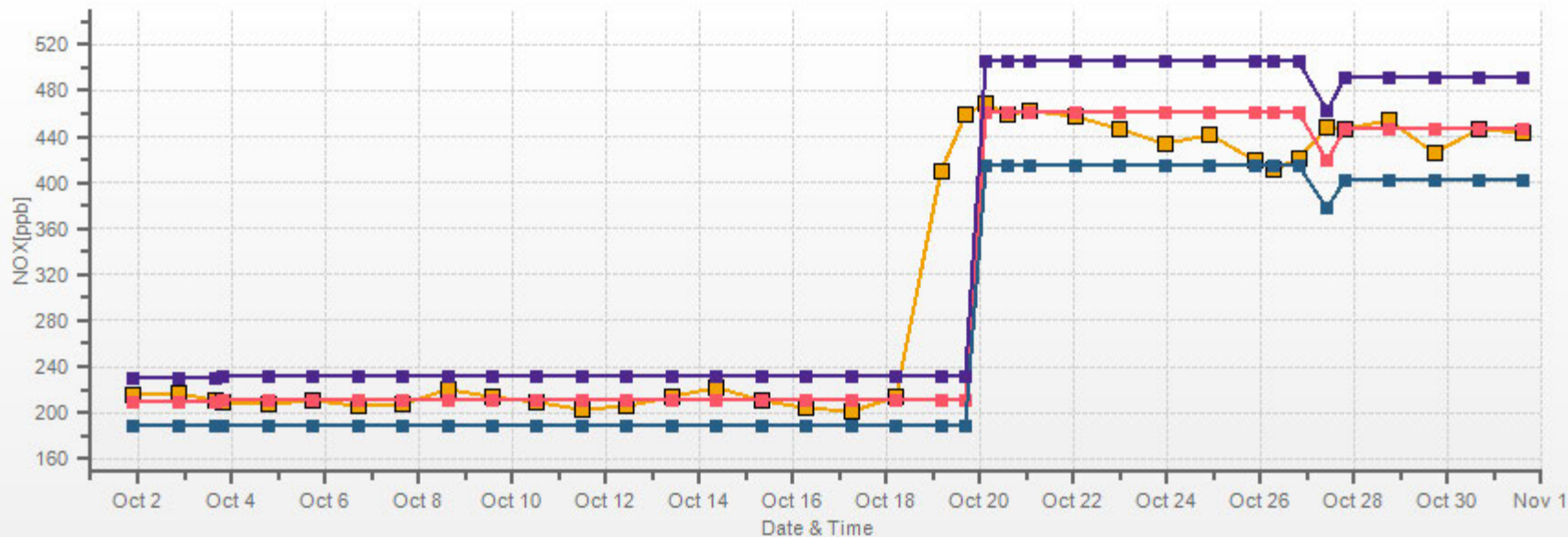


>29.0

LICA MASKWA Poll.: LICA MASKWA-NOX[ppb] 2017/10/01 00:00 - 2017/10/31 23:00 Calm: 6.03% Calm Poll Avg: 3.78[ppb]



NOX[ppb] Calibration: LICA MASKWA Monthly: 17/10 Type: Span



Span Meas Span Ref Span Low Span High

NITRIC OXIDES

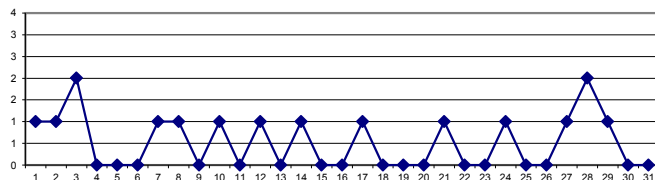
NITRIC OXIDE Hourly Averages (NO ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY																													
1	3	5	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	5	1	24
2	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	S	1	1	0	1	1	24
3	0	0	0	1	0	1	2	4	9	14	C	C	C	C	C	C	C	0	0	0	S	0	0	0	0	14	2	24	
4	0	0	0	0	0	0	1	2	1	1	1	0	0	0	0	0	0	0	0	0	S	0	0	0	0	2	0	24	
5	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	S	0	0	0	0	0	1	0	24	
6	0	0	0	0	0	0	0	0	1	1	2	1	0	0	0	0	0	S	0	0	0	0	0	0	0	2	0	24	
7	0	0	0	0	0	0	0	0	0	0	0	0	1	1	8	2	S	0	0	0	7	3	0	0	0	8	1	24	
8	1	1	0	0	0	2	1	2	3	1	1	0	1	2	2	S	2	1	0	0	0	0	0	0	0	3	1	24	
9	0	0	0	0	0	0	0	0	0	0	1	1	1	S	0	0	0	0	0	0	0	0	0	0	0	1	0	24	
10	0	0	0	0	0	0	2	9	4	3	1	0	S	0	0	0	0	0	0	0	0	0	0	0	0	9	1	24	
11	0	0	0	0	0	0	0	0	0	0	0	0	S	1	1	1	0	0	0	0	0	0	0	0	0	1	0	24	
12	0	0	0	0	0	0	0	0	0	0	0	S	2	2	4	2	3	2	0	0	0	0	0	0	0	4	1	24	
13	0	0	0	0	0	1	0	0	0	1	S	1	0	1	1	0	0	0	0	0	0	0	0	0	0	1	0	24	
14	0	0	0	0	0	0	0	1	1	S	2	2	2	2	2	1	1	0	0	0	0	0	0	0	0	2	1	24	
15	0	0	0	0	0	0	2	S	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	2	0	24	
16	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24	
17	0	0	0	0	0	0	S	1	1	1	1	1	1	1	1	0	0	3	2	2	2	0	0	0	0	3	1	24	
18	0	0	0	0	0	S	0	0	0	3	1	0	0	C1	C1	C1	C1	C1	Y	Y	Y	Y	Y	Y	0	3	0	13	
19	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	C1	C1	C1	C1	C1	C1	0	0	0	0	0	0	0	0	0	0	6	
20	0	0	0	S	0	0	0	0	0	0	0	C1	C1	C1	C1	C1	0	0	0	0	0	0	1	0	0	1	0	19	
21	1	1	S	0	2	0	0	0	1	3	2	2	1	2	0	1	0	0	0	0	0	0	0	0	0	3	1	24	
22	0	S	0	0	0	0	0	0	0	0	0	0	1	2	1	1	0	0	0	0	0	0	0	0	0	2	0	24	
23	S	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	S	0	1	0	24	
24	0	0	0	0	0	0	0	0	0	0	0	1	2	1	3	1	4	1	0	0	0	S	0	0	0	4	1	24	
25	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	1	0	24	
26	0	0	0	0	0	0	0	S1	1	1	0	0	0	C1	C1	C1	C1	C1	C1	C1	C1	0	0	0	0	1	0	15	
27	0	0	0	0	0	0	1	3	2	5	S1	6	4	3	1	0	0	0	S	0	0	0	0	0	0	6	1	23	
28	0	0	0	0	1	1	0	0	1	8	6	0	0	0	0	0	0	0	S	9	4	2	6	6	0	9	2	24	
29	2	3	6	6	0	0	3	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	6	1	24	
30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	24	
31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	24	
HOURLY MAX	3	5	6	6	2	2	3	4	9	14	6	6	4	3	8	2	3	4	3	9	7	3	6	6					
HOURLY AVG	0	0	0	0	0	0	0	1	1	2	1	1	1	1	1	0	0	0	0	0	1	0	0	0					

STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

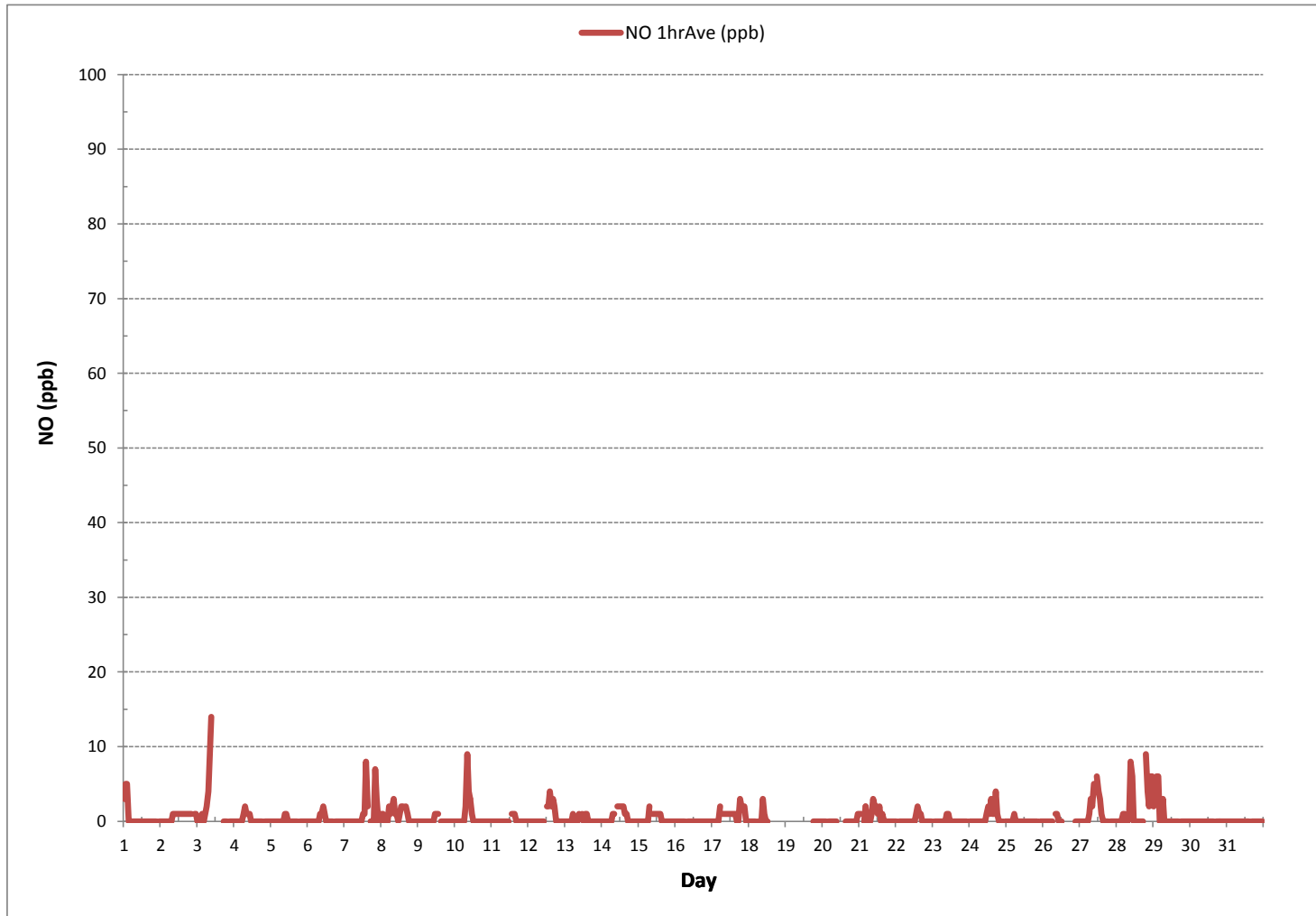
24 HR AVERAGES October 2017



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	159			
MINIMUM 1-HR AVERAGE:	0 ppb	@ HOUR	3	ON DAY
MAXIMUM 1-HR AVERAGE:	14 ppb	@ HOUR	3	ON DAY
MAXIMUM 24-HR AVERAGE:	2 ppb			ON DAY
IZS CALIBRATION TIME:	30 hrs	OPERATIONAL TIME:	700 hrs	
MONTHLY CALIBRATION TIME:	7 hrs	AMD OPERATION UPTIME:	94.1 %	
STANDARD DEVIATION:	1	MONTHLY AVERAGE:	1 ppb	

NITRIC OXIDE Hourly Averages (NO ppb)





NITRIC OXIDE Instantaneous Maximum (NO ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY																													
1	9	13	20	0	0	1	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	20	2	24
2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	24
3	0	0	0	5	2	2	4	7	37	32	C	C	C	C	C	C	C	0	7	0	S	0	0	0	0	0	37	6	24
4	0	0	0	0	2	0	4	5	1	4	1	1	3	1	0	0	0	0	0	S	0	0	0	0	0	0	5	1	24
5	0	0	0	0	0	0	4	0	1	2	1	1	3	0	0	1	0	0	S	0	0	0	0	0	0	0	4	1	24
6	0	0	0	0	0	1	0	1	9	2	2	11	0	1	1	1	0	S	0	0	0	0	0	0	0	0	11	1	24
7	0	0	0	0	0	0	0	0	0	0	7	1	6	3	16	11	S	3	0	0	21	16	0	0	0	0	21	4	24
8	7	9	2	5	3	12	15	9	7	4	4	2	4	11	9	S	10	5	1	2	0	0	0	0	0	0	15	5	24
9	0	0	0	0	0	0	0	0	0	1	1	2	1	1	S	0	0	0	0	0	0	0	0	0	0	0	2	0	24
10	0	0	0	0	0	0	0	7	51	8	5	2	0	S	0	0	0	0	0	0	0	0	0	0	0	0	51	3	24
11	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
12	0	0	0	0	0	0	0	1	0	0	0	S	12	12	11	8	12	6	0	0	0	0	0	0	0	0	12	3	24
13	0	0	0	0	1	3	0	1	0	4	S	1	4	4	4	0	0	0	0	0	1	0	0	0	0	0	4	1	24
14	0	1	0	0	0	2	1	1	1	S	1	1	3	1	1	0	1	0	0	0	0	0	0	0	0	0	3	1	24
15	0	0	0	0	0	0	0	2	S	1	1	1	0	6	1	0	0	0	0	0	0	0	0	0	0	0	6	1	24
16	0	0	0	0	0	4	0	S	0	0	2	5	1	1	0	0	0	0	0	0	0	0	0	0	0	0	5	1	24
17	0	0	0	0	0	18	S	4	0	0	1	0	2	0	0	0	3	0	8	4	6	8	0	0	0	0	18	2	24
18	0	0	0	0	0	S	0	9	2	13	4	0	1	C1	C1	C1	C1	C1	Y	Y	Y	Y	Y	Y	0	13	2	13	
19	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	C1	C1	C1	C1	C1	C1	1	1	1	1	1	1	1	1	1	1	6	
20	1	1	1	S	1	1	1	1	1	1	C1	C1	C1	C1	C1	3	1	1	1	1	1	1	1	3	1	3	1	19	
21	3	3	S	3	5	0	0	0	2	5	4	6	5	2	1	2	0	0	0	0	0	0	0	0	0	0	6	2	24
22	0	S	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	2	0	24	
23	S	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	2	0	24
24	0	0	0	0	0	0	0	0	0	0	0	1	5	5	5	2	7	7	8	0	0	0	S	0	0	8	2	24	
25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	24
26	0	0	0	0	0	0	0	S1	1	0	0	0	0	C1	C1	C1	C1	C1	C1	C1	C1	0	0	0	0	0	1	0	15
27	0	0	0	0	0	2	3	7	2	7	S1	6	4	3	0	0	0	0	0	S	0	0	0	0	0	0	7	2	23
28	0	0	0	0	1	1	0	0	2	9	11	0	0	0	0	0	0	0	S	S	12	9	12	13	9	0	13	3	24
29	6	7	9	10	4	0	11	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	11	2	24
30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	24
31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	24
HOURLY MAX	9	13	20	10	5	18	15	9	51	32	11	11	12	12	16	11	12	7	8	12	21	16	13	9					
HOURLY AVG	1	1	1	1	1	2	2	2	4	3	2	2	2	2	2	1	1	1	1	1	1	1	1	0					

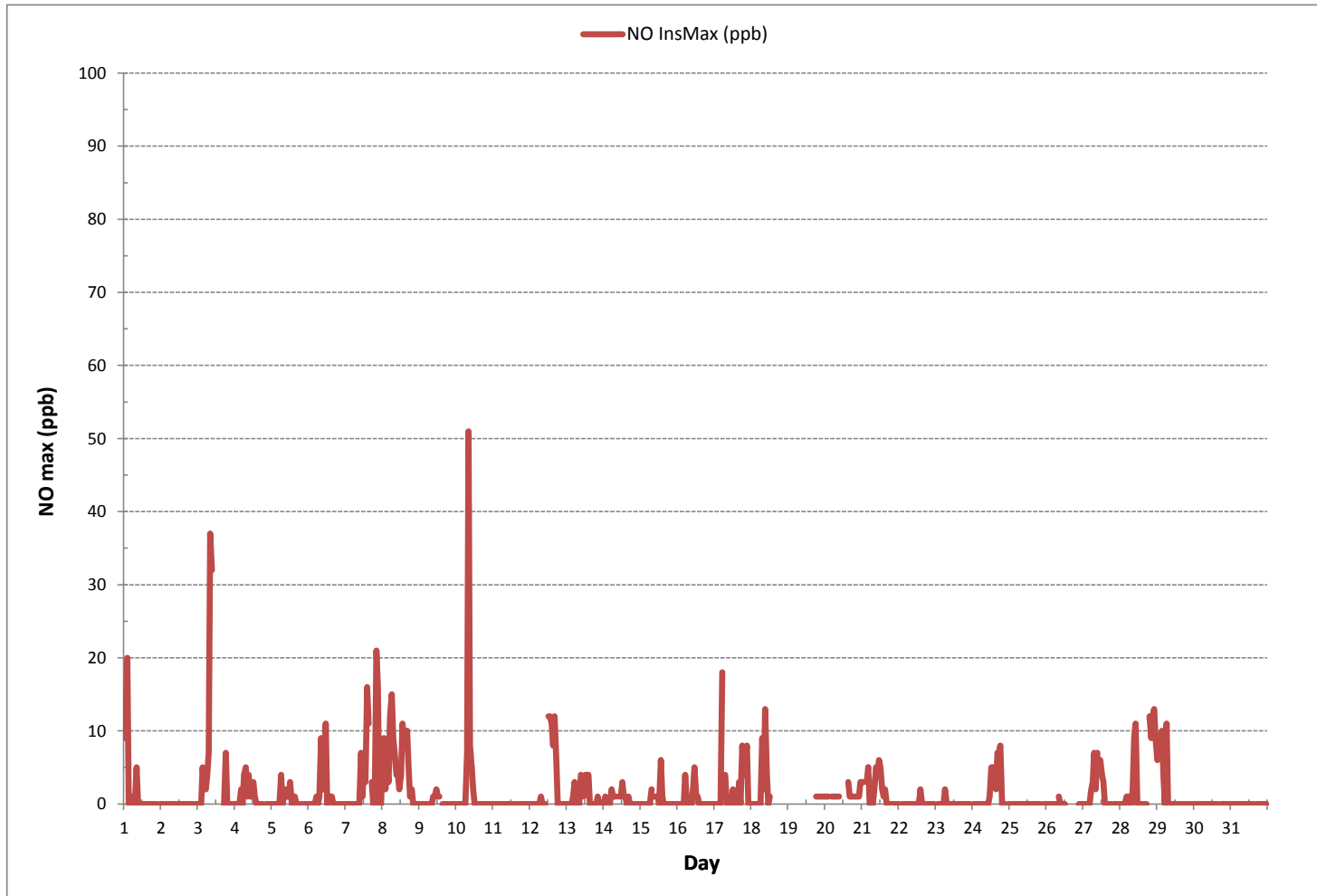
STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	199
MAXIMUM INSTANTANEOUS VALUE:	51 ppb @ HOUR 8 ON DAY 10
IZS CALIBRATION TIME:	30 hrs
MONTHLY CALIBRATION TIME:	7 hrs
STANDARD DEVIATION:	4
OPERATIONAL TIME:	700 hrs

NITRIC OXIDE Instantaneous Maximum (NO ppb)



Wind: LICA MASKWA
 Poll.: LICA MASKWA-NO[ppb]
 Monthly: 17/10
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 6.03% Calm Avg: 0.73 [ppb]

Direction	0.0-5.0	5.0-10.0	10.0-15.0	>15.0	Total
N	17.4	0.0	0.0	0.0	17.4
NE	9.2	0.0	0.0	0.0	9.2
E	3.3	0.0	0.0	0.0	3.3
SE	1.5	0.0	0.0	0.0	1.5
S	8.9	0.2	0.0	0.0	9.1
SW	22.9	0.0	0.2	0.0	23.1
W	15.8	0.5	0.0	0.0	16.3
NW	13.1	1.1	0.0	0.0	14.2
Summary	92.2	1.7	0.2	0.0	94.0

% Icon Classes (ppb)

92

0.0-5.0

2

5.0-10.0

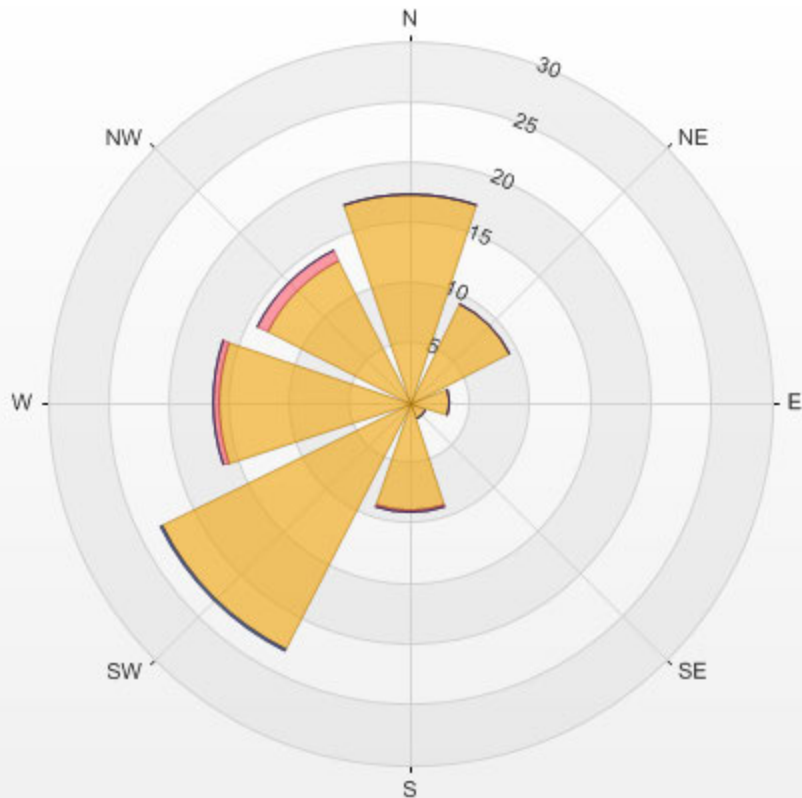
0

10.0-15.0

0

>15.0

LICA MASKWA Poll.: LICA MASKWA-NO[ppb] 2017/10/01 00:00 - 2017/10/31 23:00 Calm: 6.03% Calm Poll Avg: 0.73[ppb]



NITROGEN DIOXIDE

NITROGEN DIOXIDE Hourly Averages (NO₂ ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.			
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.				
DAY	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1				
1	11	12	9	1	1	1	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	S	2	0	12	2	24		
2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	S	2	4	0	4	0	24		
3	5	4	4	7	7	10	9	9	8	10	C	C	C	C	C	C	C	1	1	1	1	S	7	4	5	1	10	6	24		
4	6	9	6	5	9	5	13	11	3	2	2	2	1	1	1	1	0	1	2	S	1	1	2	2	2	0	13	4	24		
5	2	2	2	2	2	2	2	3	3	4	3	3	1	1	1	1	1	1	1	S	3	2	2	2	2	1	4	2	24		
6	2	2	3	3	3	4	4	4	3	4	5	4	3	4	4	5	5	S	6	5	6	6	6	3	1	1	6	4	24		
7	1	1	0	0	1	1	0	0	0	0	0	2	6	4	11	5	S	3	0	0	9	4	1	0	0	0	11	2	24		
8	2	4	1	1	0	5	3	4	5	2	1	1	2	3	3	S	5	6	2	4	1	2	3	2	0	0	6	3	24		
9	1	0	0	2	3	1	2	3	3	3	4	3	3	2	S	1	0	0	0	1	1	1	2	6	0	0	6	2	24		
10	7	4	2	1	1	2	2	7	5	7	7	5	1	S	2	1	0	0	0	0	0	0	0	0	0	0	7	2	24		
11	0	0	1	1	1	1	1	1	1	1	1	1	1	S	0	0	1	1	1	0	0	0	0	0	0	0	1	1	24		
12	0	0	1	2	2	2	3	2	2	2	1	S	4	2	7	5	6	4	1	1	1	1	1	1	1	0	7	2	24		
13	1	2	2	2	2	7	2	1	2	2	S	3	2	1	2	2	2	2	1	3	3	2	4	3	1	1	7	2	24		
14	2	4	4	3	2	4	4	4	4	S	3	3	2	3	2	3	2	4	3	2	1	1	1	2	1	1	4	3	24		
15	2	1	2	4	2	3	3	4	S	2	2	2	2	1	1	2	2	3	3	4	4	6	8	8	1	1	8	3	24		
16	7	3	9	4	1	1	1	S	2	1	1	1	1	2	1	1	1	1	1	1	1	2	1	1	1	1	9	2	24		
17	1	1	1	1	1	1	S	2	2	3	3	2	4	3	4	3	5	8	5	5	5	3	1	1	1	1	8	3	24		
18	0	1	2	1	0	S	10	5	3	6	3	1	1	C1	C1	C1	C1	C1	Y	Y	Y	Y	Y	Y	Y	0	10	3	13		
19	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	C1	C1	C1	C1	C1	C1	C1	6	2	1	1	0	0	0	0	6	2	6		
20	0	0	0	S	0	0	0	0	0	0	C1	C1	C1	C1	C1	4	1	1	3	4	1	1	3	0	4	1	3	0	19		
21	5	4	S	0	14	4	8	10	11	7	6	6	4	5	2	4	0	0	1	1	1	1	0	1	0	0	14	4	24		
22	1	S	1	1	1	0	0	0	0	0	0	1	1	2	5	5	5	6	5	1	1	1	1	0	0	0	6	2	24		
23	S	0	0	0	0	0	1	0	1	2	1	0	0	0	0	0	0	1	1	5	6	3	S	0	0	0	6	1	24		
24	2	2	3	3	3	3	4	5	3	0	1	2	4	3	11	6	8	16	8	0	0	0	S	0	0	0	16	4	24		
25	0	1	0	0	0	6	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	6	0	24		
26	0	0	0	2	3	3	S1	2	2	0	0	0	0	C1	C1	C1	C1	C1	C1	C1	C1	5	4	6	0	0	6	2	15		
27	6	7	8	3	3	6	9	9	4	5	S1	5	4	5	3	2	2	2	3	S	3	3	3	4	2	2	9	5	23		
28	4	4	5	9	15	15	7	3	3	9	6	1	0	2	2	2	0	3	S	19	13	5	14	14	0	0	19	7	24		
29	5	7	16	15	1	0	9	0	0	0	0	1	1	0	0	1	0	S	1	1	1	1	1	2	0	0	16	3	24		
30	3	3	3	4	3	3	4	5	4	2	2	2	1	2	2	3	S	3	3	3	3	3	3	3	3	1	5	3	24		
31	2	2	10	14	14	12	11	8	7	8	8	6	4	3	3	S	2	1	1	1	1	0	0	0	0	0	14	5	24		
HOURLY MAX	11	12	16	15	15	15	13	11	11	10	8	6	6	5	11	6	8	16	8	19	13	7	14	14							
HOURLY AVG	3	3	3	3	3	4	4	4	3	3	2	2	2	2	3	2	2	3	2	2	3	2	2	3							

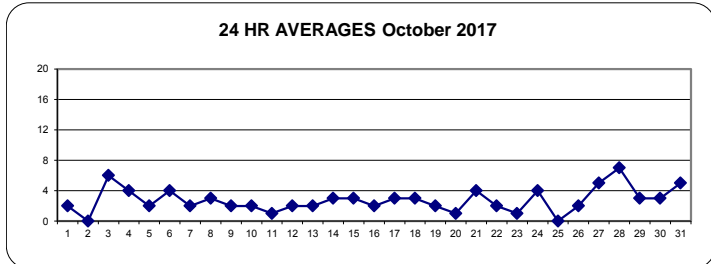
STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT: 1-HR 159 ppb

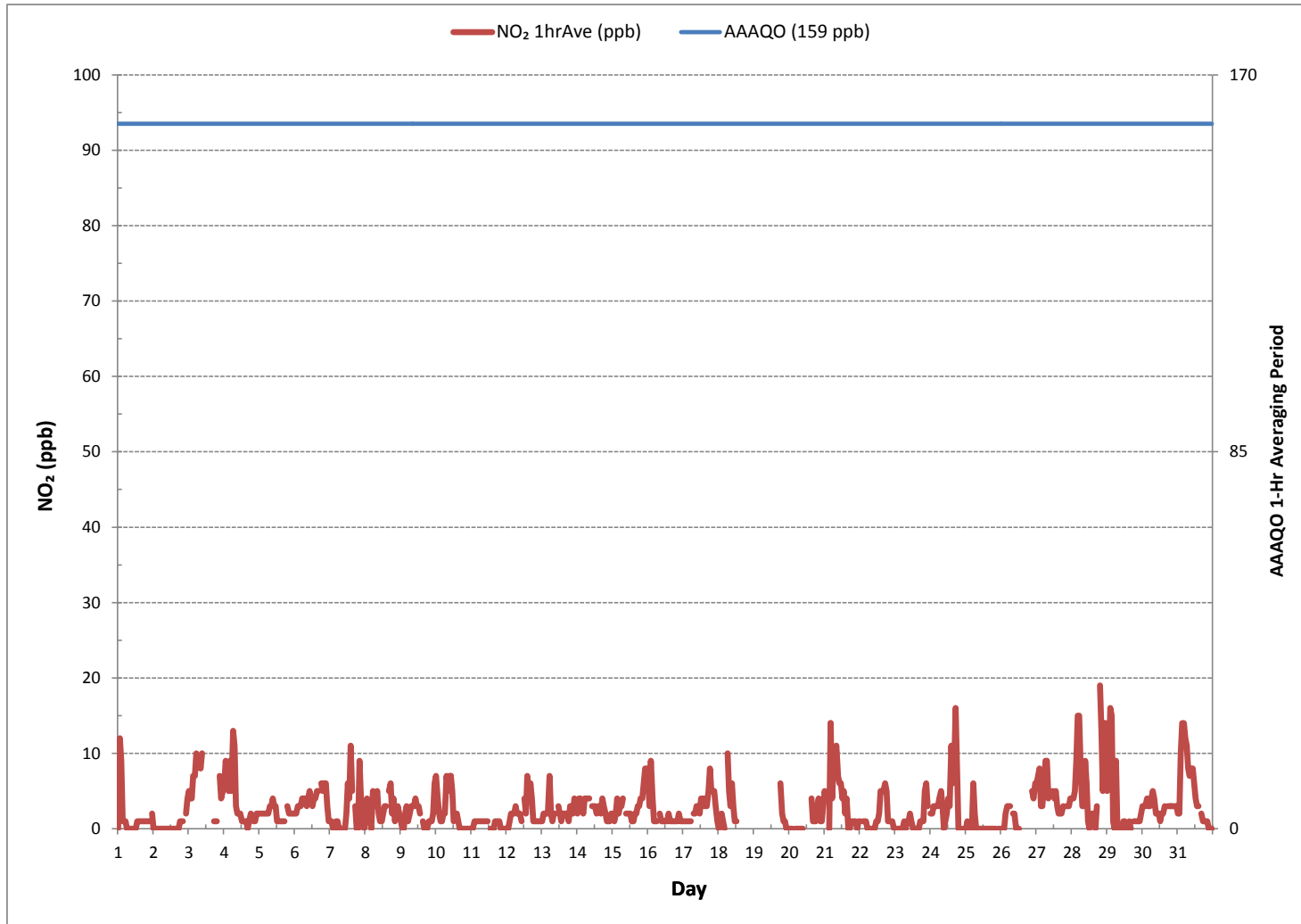
24 HR AVERAGES October 2017



MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0				
NUMBER OF NON-ZERO READINGS:	523				
MINIMUM 1-HR AVERAGE:	0	ppb	@ HOUR	6 ON DAY	1
MAXIMUM 1-HR AVERAGE:	19	ppb	@ HOUR	19 ON DAY	28
MAXIMUM 24-HR AVERAGE:	7	ppb		ON DAY	28
IZS CALIBRATION TIME:	30	hrs	OPERATIONAL TIME:	700	hrs
MONTHLY CALIBRATION TIME:	7	hrs	AMD OPERATION UPTIME:	94.1	%
STANDARD DEVIATION:	3		MONTHLY AVERAGE:	3	ppb

NITROGEN DIOXIDE Hourly Averages (NO₂ ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Maskwa Continuous Monitoring Station - October 2017

NITROGEN DIOXIDE Instantaneous Maximum (NO₂ ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY																													
1	23	25	25	1	1	4	4	0	5	0	0	0	0	1	2	2	1	2	1	2	1	1	S	3	0	25	5	24	
2	1	1	0	0	0	0	0	1	1	1	1	1	1	1	1	0	1	1	1	2	2	S	4	5	0	5	1	24	
3	6	5	6	14	14	14	13	11	16	15	C	C	C	C	C	C	C	2	4	1	S	8	6	8	1	16	9	24	
4	8	11	9	12	15	8	19	14	5	3	2	2	6	3	2	1	2	2	2	S	3	2	2	3	1	19	6	24	
5	2	3	3	2	2	3	5	5	3	4	4	3	4	2	1	3	1	1	S	3	2	2	3	3	1	5	3	24	
6	3	3	3	3	4	4	5	4	6	5	7	6	4	4	5	5	5	S	6	5	9	9	6	2	2	9	5	24	
7	1	1	1	3	3	2	1	1	1	1	5	9	12	8	17	11	S	9	1	0	18	16	2	1	0	18	5	24	
8	12	14	5	9	6	14	17	13	13	5	6	4	7	14	15	S	17	15	6	10	5	5	6	5	4	17	10	24	
9	2	1	1	3	4	2	4	4	4	4	5	4	3	2	S	2	1	1	1	1	1	2	4	8	1	8	3	24	
10	9	6	3	2	5	4	4	13	12	9	9	6	2	S	2	1	1	0	0	1	0	0	0	0	0	13	4	24	
11	0	0	0	0	0	0	0	0	0	0	0	0	S	1	1	1	1	1	1	0	0	0	0	0	0	1	0	24	
12	0	0	1	3	2	2	3	4	2	2	2	S	16	16	19	16	17	17	1	3	1	1	1	1	0	19	6	24	
13	1	2	2	3	7	14	3	4	1	9	S	7	4	5	7	3	3	5	1	3	5	3	5	4	1	14	4	24	
14	3	4	4	3	3	5	5	5	4	S	4	3	4	2	4	4	5	5	4	2	1	1	1	1	1	5	3	24	
15	1	1	5	5	3	4	4	6	S	3	3	3	2	4	3	2	3	4	4	5	9	11	9	1	11	4	24		
16	9	4	12	8	1	6	1	S	2	2	2	4	3	3	2	4	2	1	1	1	2	4	2	1	1	12	3	24	
17	1	1	1	1	1	7	S	4	3	4	5	4	9	4	6	4	6	7	15	10	11	13	6	4	1	15	6	24	
18	1	4	4	5	1	S	12	10	6	14	8	2	3	C1	C1	C1	C1	C1	Y	Y	Y	Y	Y	Y	1	14	6	13	
19	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	C1	C1	C1	C1	C1	C1	C1	12	6	2	3	2	2	12	5	6	
20	1	2	1	S	1	1	1	1	1	1	C1	C1	C1	C1	C1	8	3	2	3	8	10	5	4	9	1	10	3	19	
21	9	9	S	15	18	10	13	13	15	10	8	10	9	7	6	9	0	0	1	0	0	0	0	2	0	18	7	24	
22	1	S	1	0	0	0	0	0	0	0	1	1	0	2	8	6	9	19	21	1	0	0	0	0	0	21	3	24	
23	S	0	0	0	0	0	4	0	0	3	2	2	0	0	0	0	0	1	1	2	9	7	3	S	0	9	2	24	
24	2	2	2	2	2	2	5	6	5	0	2	6	10	14	18	10	19	23	26	0	0	1	S	0	0	26	7	24	
25	1	1	0	0	2	8	3	0	0	0	0	0	0	1	0	0	0	0	0	0	0	S	0	0	0	8	1	24	
26	0	0	0	2	3	4	4	S1	3	2	0	0	0	C1	C1	C1	C1	C1	C1	C1	C1	7	5	7	0	7	2	15	
27	7	9	10	4	5	7	12	12	7	7	S1	6	5	5	4	2	2	2	4	S	3	3	4	4	2	12	6	23	
28	4	4	5	11	16	16	11	7	7	9	10	1	0	4	5	5	1	14	S	24	23	20	22	20	0	24	10	24	
29	15	16	20	20	12	0	22	0	0	0	1	1	1	0	0	0	0	S	1	1	1	1	1	1	4	0	22	5	24
30	4	3	3	4	3	3	4	5	5	2	3	2	1	2	2	3	S	4	3	3	4	3	3	3	1	5	3	24	
31	3	4	14	18	19	15	14	8	7	8	8	6	5	3	3	S	3	2	2	3	2	0	0	0	0	19	6	24	
HOURLY MAX	23	25	25	20	19	16	22	14	16	15	10	10	16	16	19	16	19	23	26	24	23	20	22	20					
HOURLY AVG	4	5	5	5	5	5	7	5	5	4	4	3	4	4	5	4	4	5	5	4	4	5	4	4					

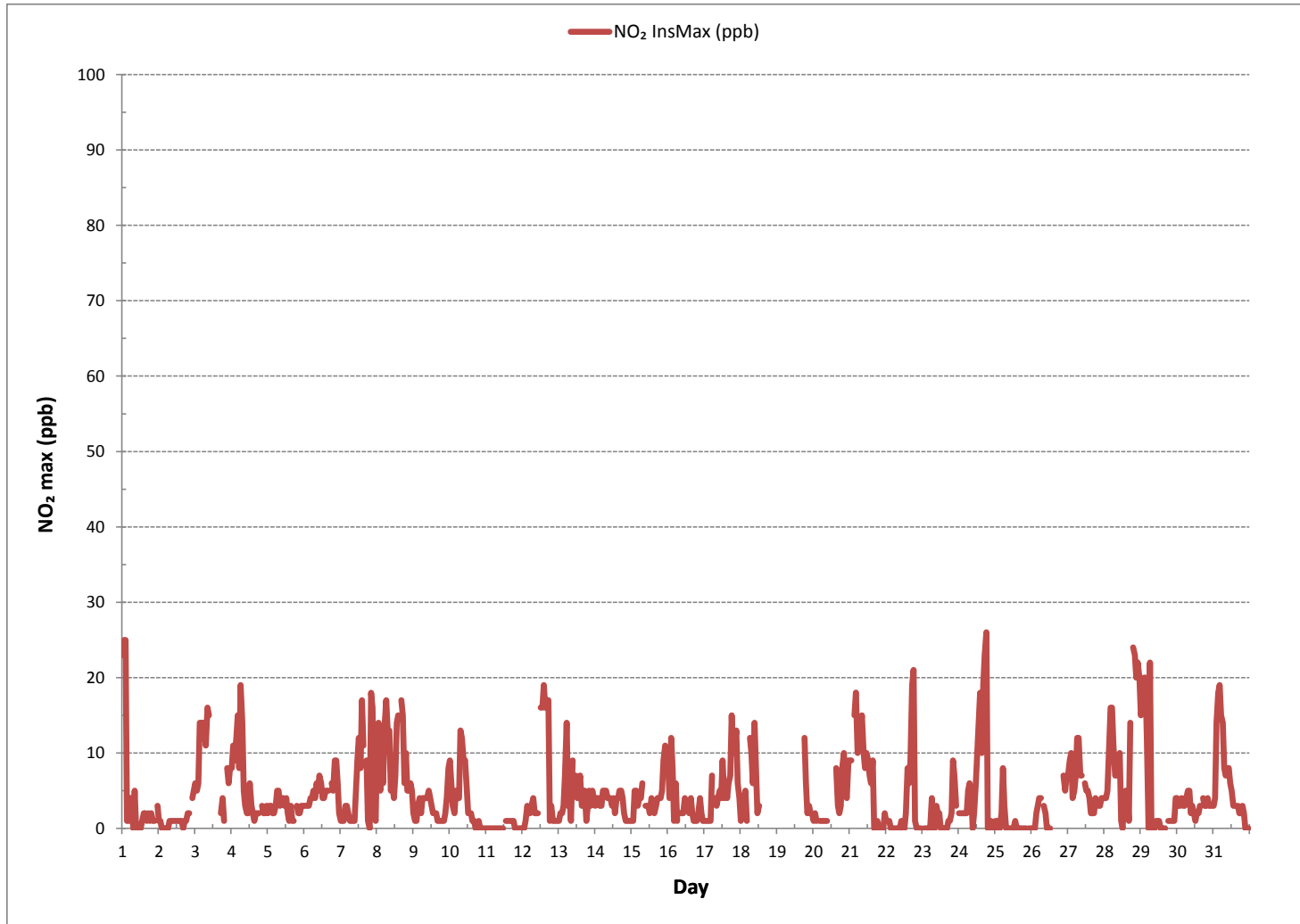
STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	557
MAXIMUM INSTANTANEOUS VALUE:	26 ppb @ HOUR 18 ON DAY 24
	VAR-VARIOUS
IZS CALIBRATION TIME:	30 hrs
MONTHLY CALIBRATION TIME:	7 hrs
OPERATIONAL TIME:	700 hrs
STANDARD DEVIATION:	5

NITROGEN DIOXIDE Instantaneous Maximum (NO₂ ppb)



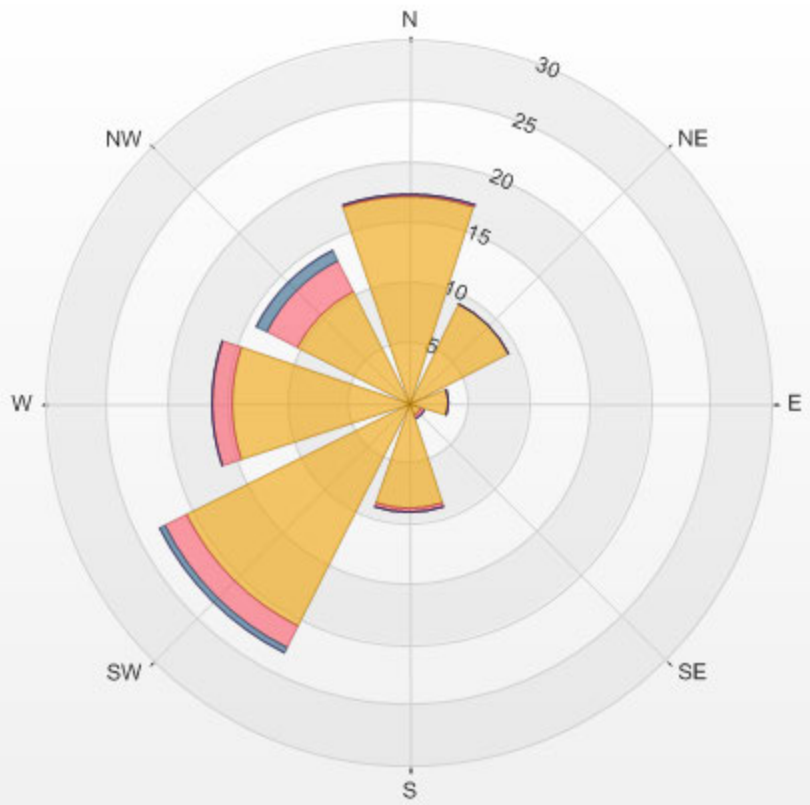
Wind: LICA MASKWA
 Poll.: LICA MASKWA-NO₂[ppb]
 Monthly: 17/10
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 6.03% Calm Avg: 3.05 [ppb]

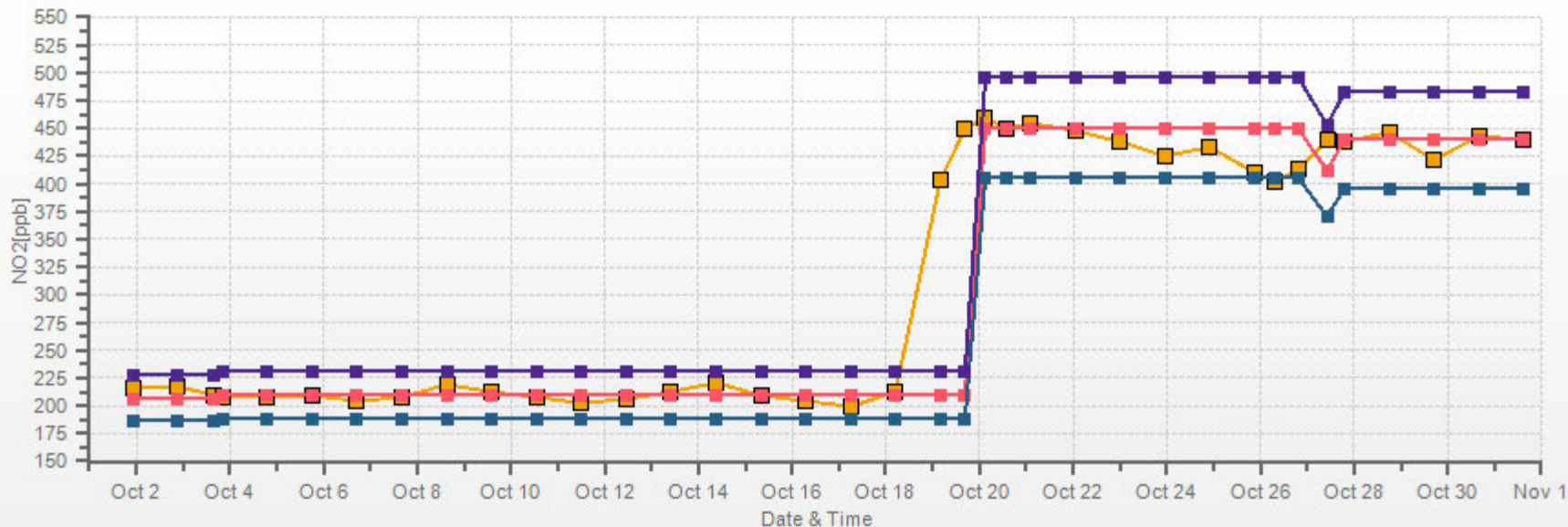
Direction	0.0-6.7	6.7-13.3	13.3-20.0	>20.0	Total
N	17.0	0.3	0.0	0.0	17.3
NE	9.2	0.0	0.0	0.0	9.2
E	3.3	0.0	0.0	0.0	3.3
SE	1.2	0.3	0.0	0.0	1.5
S	8.8	0.3	0.0	0.0	9.1
SW	20.7	2.0	0.5	0.0	23.1
W	14.6	1.7	0.0	0.0	16.3
NW	10.4	2.7	1.1	0.0	14.2
Summary	85.2	7.2	1.5	0.0	94.0

% Icon Classes (ppb) 85 0.0-6.7 7 6.7-13.3 2 13.3-20.0 0 >20.0

LICA MASKWA Poll.: LICA MASKWA-NO2[ppb] 2017/10/01 00:00 - 2017/10/31 23:00 Calm: 6.03% Calm Poll Avg: 3.05[ppb]



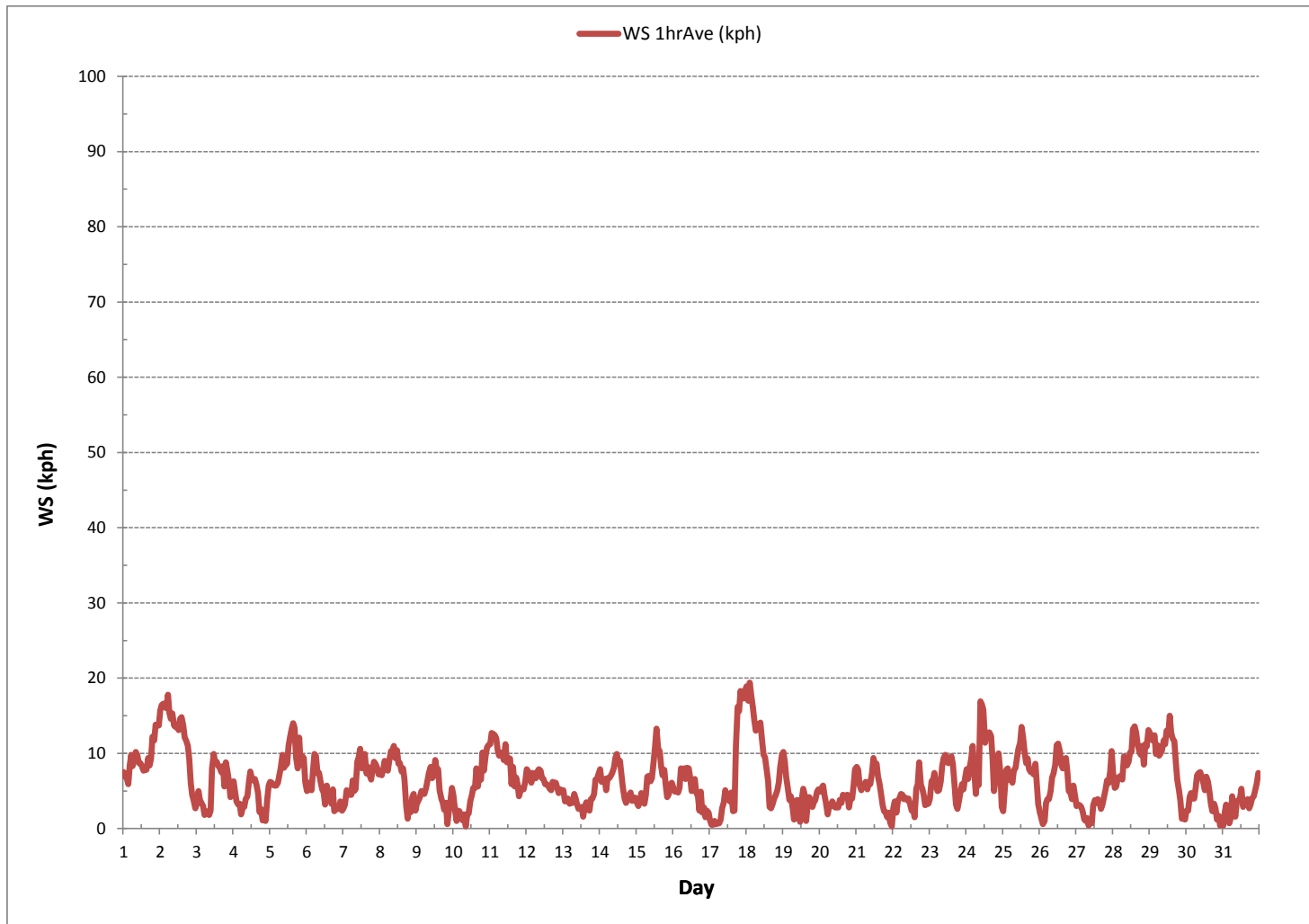
NO2[ppb] Calibration: LICA MASKWA Monthly: 17/10 Type: Span



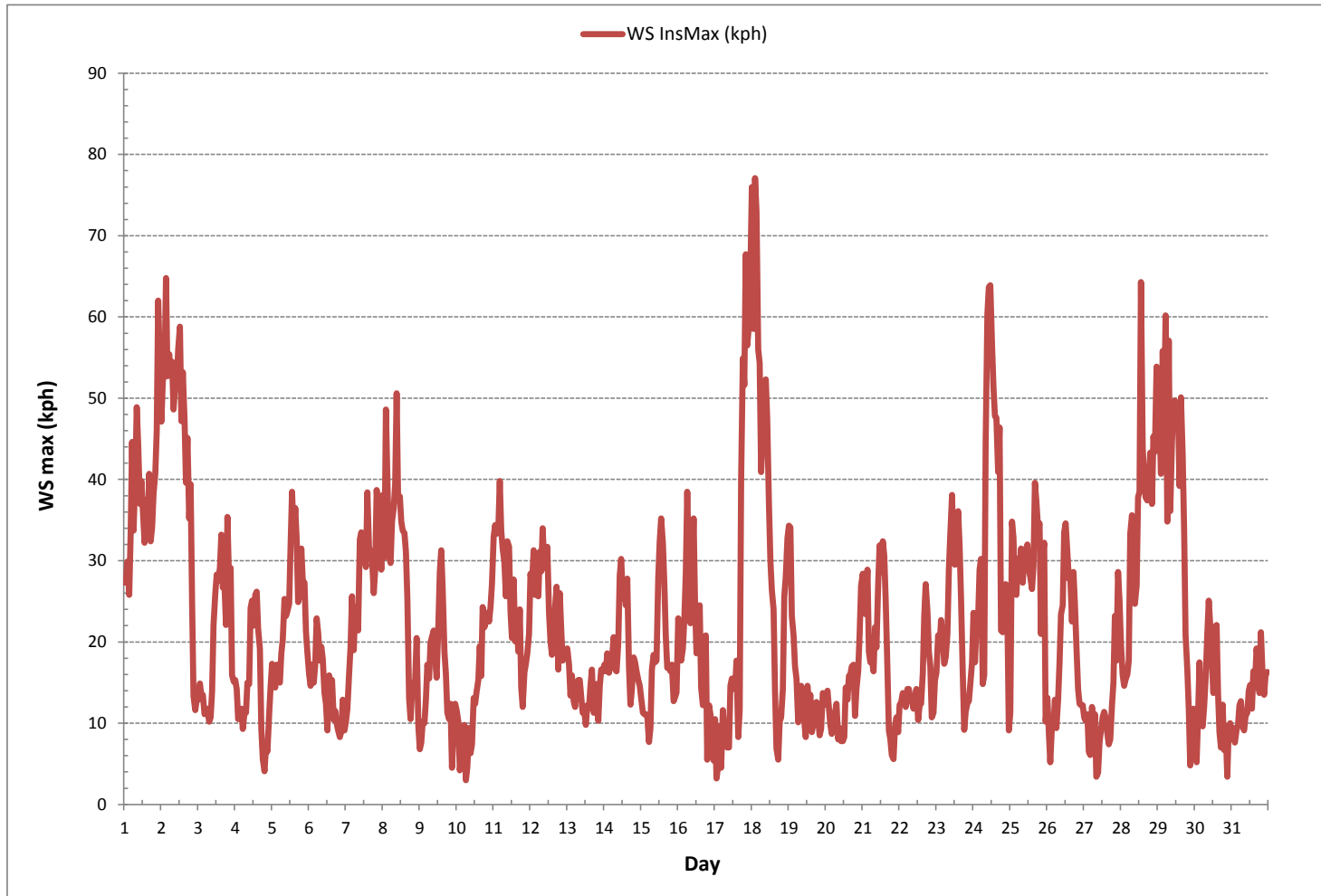
Span Meas Span Ref Span Low Span High

WIND SPEED

WIND SPEED Hourly Averages (WS kph)









WIND SPEED Instantaneous Maximum (WS kph)



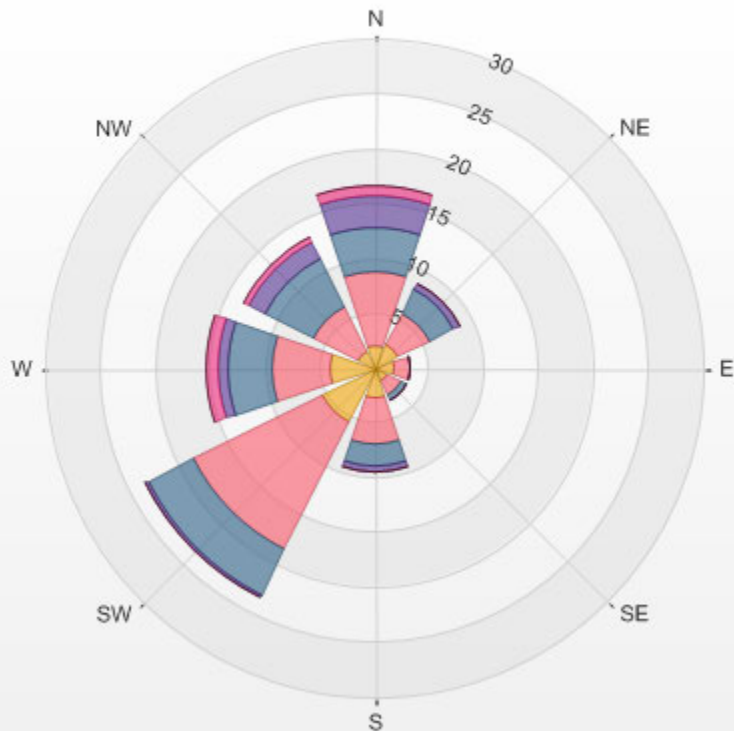
Wind: LICA MASKWA
 Monitor: WSP [kph]
 Monthly: 17/10
 Type: WindRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 6.18%

Direction	1.8-3.9	3.9-7.8	7.8-11.7	11.7-15.6	15.6-19.5	>19.5	Total
N	2.2	6.7	4.0	3.0	0.8	0.0	16.7
NE	2.4	3.2	2.4	0.7	0.0	0.0	8.7
E	1.9	1.3	0.1	0.0	0.0	0.0	3.4
SE	1.2	1.6	0.5	0.0	0.0	0.0	3.4
S	2.7	4.2	2.0	0.5	0.0	0.0	9.4
SW	5.4	13.0	4.7	0.3	0.0	0.0	23.4
W	4.2	5.2	4.0	0.8	1.2	0.0	15.5
NW	1.8	4.6	5.0	1.5	0.7	0.0	13.4
Summary	21.7	39.9	22.8	6.7	2.7	0.0	93.8

%	Icon	Classes (kph)	22	40	23	7	3	0
								
			1.8-3.9	3.9-7.8	7.8-11.7	11.7-15.6	15.6-19.5	>19.5

LICA MASKWA 2017/10/01 00:00 - 2017/10/31 23:00 Calm: 6.18% Calm Wind Avg Speed: 1.02(kph)



WIND DIRECTION



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Maskwa Continuous Monitoring Station - October 2017

WIND DIRECTION Hourly Averages (WD)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	24-HOUR AVG	24-HR	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	QUADRANT	RDGS.	
DAY 1	NW	NW	NW	NW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	N	N	N	N	N	N	N	NNW	24	
2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	NNW	N	24
3	NNW	N	N	NW	NW	W	SW	W	W	SW	SW	SSW	SW	SW	SW	SW	SSW	SW	SW	SW	SW	WSW	WSW	SW	SW	SW	24
4	SW	SW	SW	WSW	WSW	WSW	WSW	WNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	WNW	SSW	S	SSW	SSE	SSW	SSW	WNW	WNW	24
5	SSW	SSW	SSW	SW	SSW	SSW	SSW	SW	SSW	SW	SW	SW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	24
6	SW	SW	SSW	SW	SSW	SSW	SSW	SSW	SSW	SW	SW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	24
7	SW	W	W	W	WSW	WSW	W	WSW	WSW	WNW	WNW	WNW	WNW	WNW	NW	NW	NW	WNW	W	W	NW	NNW	NNW	NNW	WNW	WNW	24
8	NNW	NW	NNW	NW	NNW	NW	NW	NW	NW	NNW	NW	NW	NNW	NW	NW	NNW	NW	NW	NW	W	WNW	WNW	W	WNW	WSW	NW	24
9	SSW	SSW	SSW	SSW	S	SSW	S	S	S	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	24
10	SW	SSW	S	SW	SW	SE	SSE	S	SSW	SSW	N	NNE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	24
11	NE	NE	NE	NE	NE	ENE	NE	NE	NE	NE	NE	NNE	NNE	NNE	N	NNE	NNE	NNE	N	N	N	N	N	N	NNE	NNE	24
12	N	N	N	NNW	NNW	NNW	NNW	N	N	NNW	NNW	N	NNW	NNW	NW	NW	NW	N	NNW	NNW	NNW	N	N	N	NNW	NNW	24
13	N	NNW	NNW	NNW	NW	WNW	NNW	N	N	NW	NW	NNW	NNW	WNW	WNW	W	W	WSW	SSW	SW	SSW	SSW	SSW	SSW	WNW	WNW	24
14	SSW	SSW	SSW	SSW	SSW	SSW	S	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	24
15	WSW	WSW	SW	SW	SW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	24
16	SW	WSW	SW	WSW	WSW	W	W	W	W	WNW	W	W	WSW	SW	SW	SSW	SSW	SSW	SSW	E	E	E	E	E	ENE	WSW	24
17	ENE	ESE	WNW	SE	N	ENE	NE	ENE	ENE	NE	NE	ENE	E	SE	SE	NE	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	NW	24
18	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	SSW	SE	ESE	ESE	ESE	SE	WNW	24
19	SE	SE	SE	ESE	ESE	SE	SE	SSE	SSW	SW	WNW	WSW	SSW	SSW	SW	NE	E	ESE	ESE	ENE	NE	ENE	NE	NE	SE	24	
20	ENE	ENE	NE	NE	NE	NE	NE	ENE	NE	NE	NNE	NNW	NNE	NNW	NW	NW	NW	NNW	NNW	NNW	NW	NW	NW	NW	N	24	
21	NW	NW	NNW	NW	WNW	WNW	WNW	W	WNW	NW	NW	WNW	WNW	NW	NNW	NW	W	W	SW	SSW	SE	SE	SW	WNW	WNW	24	
22	E	ENE	ENE	NE	ENE	ENE	ENE	NE	NE	ENE	ENE	E	S	N	WSW	SW	WSW	WNW	W	W	W	W	W	W	N	24	
23	W	WNW	WNW	W	W	W	W	W	W	WNW	WNW	WNW	WNW	W	WNW	WNW	W	WSW	SW	SSW	SSW	SSW	SSW	SSW	W	24	
24	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	24
25	E	ENE	ENE	ENE	E	E	E	ENE	ENE	NE	NE	NE	NNE	NNE	NNE	N	N	N	N	N	N	N	N	N	NE	24	
26	N	WNW	NNW	SW	SSW	SSW	SSW	S	SSW	SW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	24
27	WSW	WSW	SW	SSW	SSW	SW	W	W	N	WSW	ENE	SSW	SSW	SSW	SSE	S	S	SSE	SSE	SSE	S	S	S	S	SSW	SSW	24
28	SSW	SSW	SW	SSW	SSW	SW	W	WNW	WNW	WNW	WNW	WNW	W	WNW	WNW	WNW	WNW	WNW	WNW	NW	NW	NW	WNW	NW	W	24	
29	NNW	NW	NW	NW	NNW	NNW	NW	NNW	NNW	NNW	N	N	N	N	N	N	N	N	N	N	N	NNW	N	WSW	NNW	24	
30	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	S	S	S	SSW	SSW	W	S	S	WSW	SSW	24	
31	SSE	SSW	SSW	SSW	SE	ESE	SSW	S	SSE	SE	SE	ESE	SE	SE	ESE	ESE	E	E	E	E	ENE	ENE	NE	NE	NNE	ESE	24

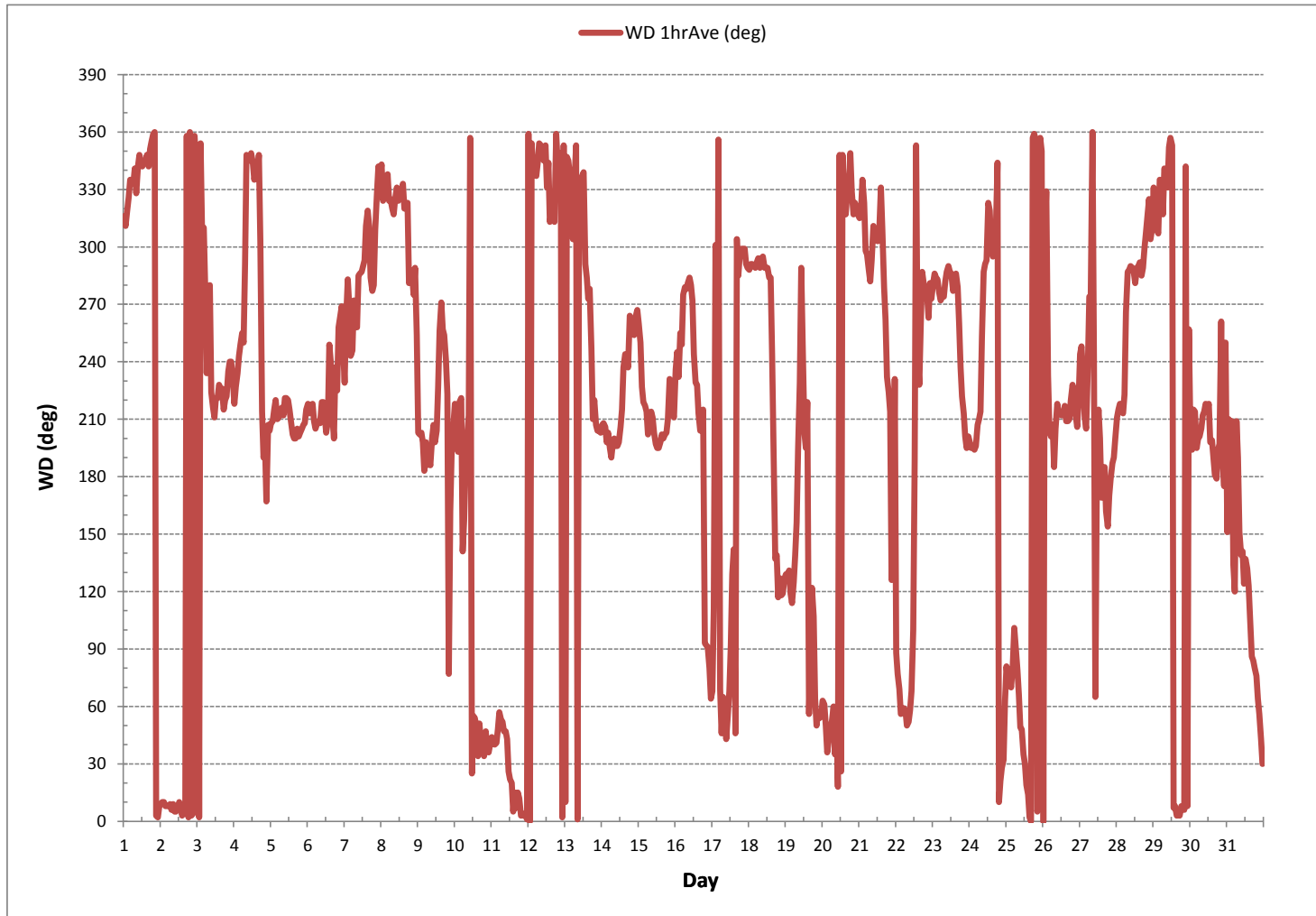
STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

LAST CALIBRATION:	March 30, 2016
DECLINATION :	MAGNETIC DECLINATION 19 DEGREE EAST

MONTHLY CALIBRATION TIME:	0	hrs	OPERATIONAL TIME:	744	hrs
STANDARD DEVIATION:	104		AMD OPERATION UPTIME:	100.0	%
			MONTHLY AVERAGE:	295 (WNW)	

WIND DIRECTION Hourly Averages (WD)



STANDARD DEVIATION WIND DIRECTION



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Maskwa Continuous Monitoring Station - October 2017

STANDARD DEVIATION WIND DIRECTION Hourly Averages (STDWD deg)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00		
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	RDGS.	
DAY																										
1	34	35	38	40	38	38	47	38	39	40	38	35	39	36	36	36	36	36	29	28	29	27	26	31	24	
2	24	24	22	25	23	25	24	25	24	25	28	27	32	27	29	27	28	28	27	29	23	21	28	39	24	
3	38	27	29	36	31	32	25	29	44	58	28	26	30	31	35	32	32	24	28	25	33	35	36	25	24	
4	16	19	23	30	29	35	31	30	36	38	38	35	36	38	38	38	34	33	15	54	41	40	15	15	24	
5	16	15	18	20	18	18	17	20	21	26	28	29	26	24	22	19	18	19	22	18	20	16	16	20	24	
6	24	18	19	23	15	13	15	18	19	24	26	23	26	29	34	36	20	14	33	25	26	26	26	32	24	
7	28	26	20	29	34	31	31	37	36	32	29	28	28	27	36	37	33	23	27	28	35	35	36	38	24	
8	39	37	38	42	37	37	38	34	38	35	39	35	40	37	43	36	38	37	63	31	47	27	27	27	24	
9	11	11	14	16	19	21	22	25	23	20	18	20	20	32	34	40	39	31	32	21	62	27	22	11	24	
10	16	19	58	17	37	28	22	32	47	41	46	27	30	28	25	16	23	24	21	16	23	17	16	18	24	
11	22	20	20	20	23	26	24	23	22	23	22	20	17	19	27	22	26	22	19	24	24	27	25	27	24	
12	26	25	30	38	35	36	36	35	32	34	32	34	38	40	38	41	38	33	26	34	37	36	31	31	24	
13	29	39	37	37	39	33	35	28	31	36	50	40	40	65	45	40	34	26	14	19	16	14	15	15	24	
14	17	20	20	21	24	21	21	18	19	20	20	20	21	26	34	38	35	30	29	39	33	36	34	30	24	
15	28	32	22	16	17	15	12	13	19	21	20	21	21	21	22	20	18	16	16	21	35	24	17	15	24	
16	31	34	31	36	30	31	29	28	30	28	31	35	40	32	29	24	16	48	28	40	57	69	24	22	24	
17	18	72	60	32	46	48	52	31	21	20	26	28	28	39	34	40	31	27	28	28	28	29	27	27	24	
18	28	29	26	27	27	28	27	26	28	29	29	32	31	29	31	36	21	10	10	13	19	23	25	28	24	
19	25	31	28	30	29	24	30	61	39	39	49	66	43	27	33	66	19	16	15	24	22	16	16	17	24	
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21	30	35	36	34	27	25	26	28	25	34	33	33	35	35	39	40	27	23	26	22	38	22	25	40	24	
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26	36	44	65	49	24	20	20	19	18	28	22	23	23	21	24	23	20	19	25	26	24	19	13	18	24	
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30	19	24	18	19	17	15	14	15	20	22	25	27	26	18	21	23	21	26	42	23	36	24	72	24	24	
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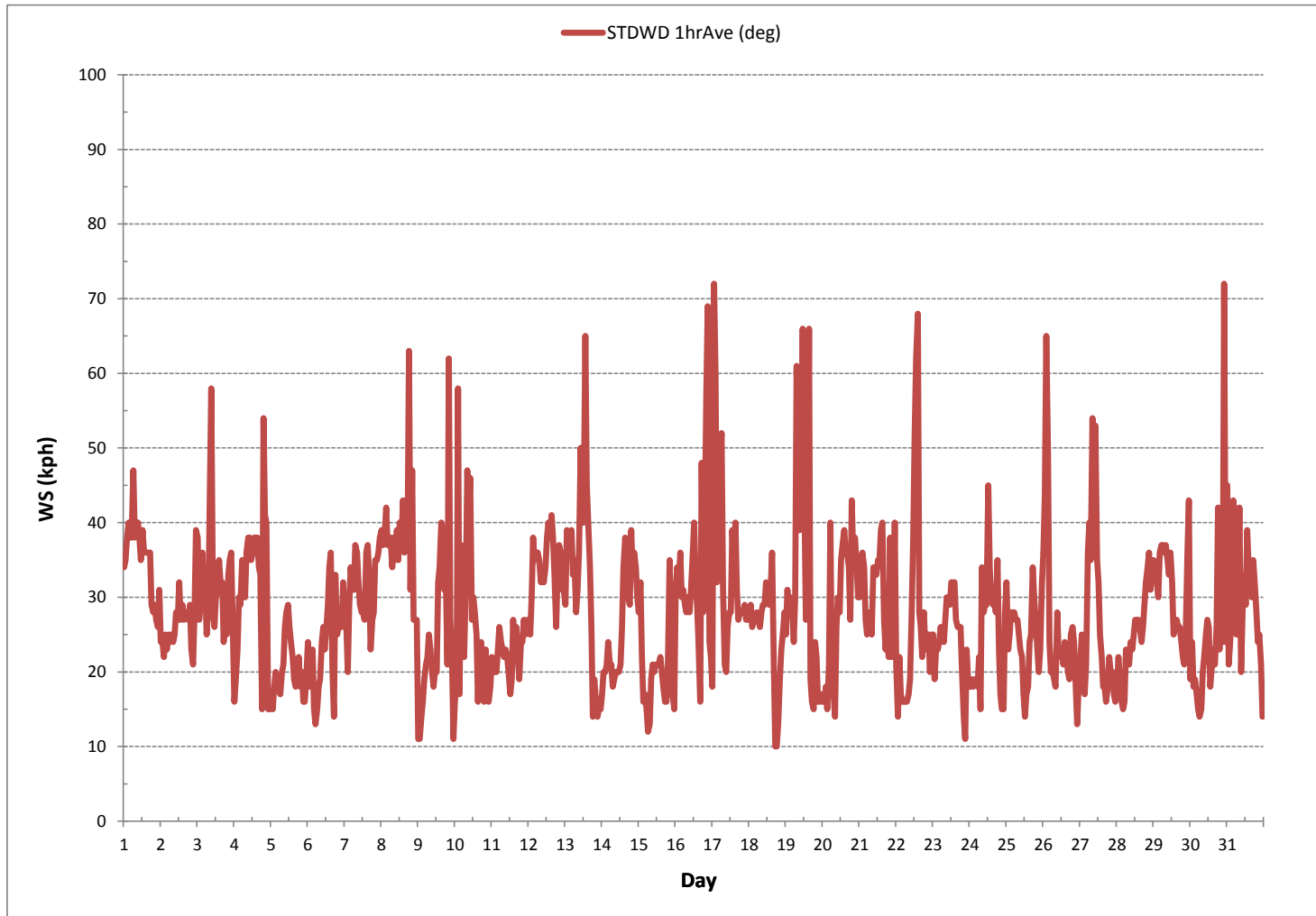
STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

LAST CALIBRATION: March 30, 2016

CALIBRATION TIME: 0 hrs OPERATIONAL TIME: 744 hrs

STANDARD DEVIATION WIND DIRECTION Hourly Averages (STDWD deg)



RELATIVE HUMIDITY



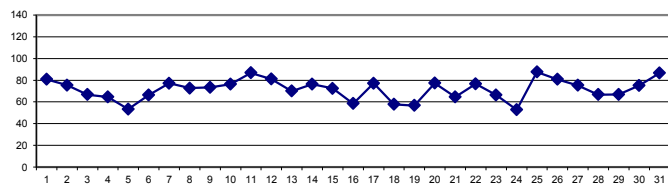
RELATIVE HUMIDITY Hourly Averages (RH %)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY																													
1	65	68	71	74	73	73	74	75	73	75	78	84	87	88	87	86	88	89	90	89	89	88	88	87	65	90	81	24	
2	84	83	80	78	78	77	79	83	80	79	78	76	75	70	65	66	64	65	66	68	72	78	81	83	64	84	75	24	
3	84	85	85	86	86	88	88	88	77	66	59	58	53	50	48	46	47	51	56	56	58	59	62	66	46	88	67	24	
4	72	75	78	79	77	79	79	73	61	52	49	45	41	40	40	40	43	53	68	74	81	85	86	76	40	86	64	24	
5	66	69	68	68	67	67	68	67	62	56	48	40	34	33	32	33	35	39	43	46	53	57	61	66	32	69	53	24	
6	72	75	77	80	81	82	82	80	72	58	47	44	47	47	48	48	53	58	65	70	76	78	75	74	44	82	66	24	
7	74	77	71	68	69	74	68	68	65	63	65	75	87	89	86	81	80	84	87	86	81	85	85	84	63	89	77	24	
8	86	90	86	83	81	79	78	76	73	70	70	69	70	68	63	60	64	70	70	68	64	65	67	74	60	90	73	24	
9	78	79	80	77	79	78	76	72	70	70	76	83	80	72	60	55	56	61	65	70	74	82	88	80	55	88	73	24	
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11	84	83	85	84	84	84	86	88	89	87	83	84	87	87	88	88	87	86	89	90	90	90	89	89	83	90	87	24	
12	87	85	86	87	88	89	88	86	83	82	81	79	79	77	77	76	77	78	79	76	76	77	76	76	76	76	89	81	24
13	76	71	71	71	71	73	74	70	69	63	61	62	62	60	61	61	61	66	73	78	82	81	81	82	60	82	70	24	
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15	87	88	87	89	91	91	91	91	89	84	81	74	65	57	54	51	51	53	55	58	60	62	63	66	51	91	72	24	
16	64	63	65	66	66	61	63	63	60	55	51	45	41	43	42	43	47	52	54	68	72	72	72	76	41	76	59	24	
17	85	89	90	91	91	90	90	90	81	74	65	58	53	50	49	56	67	73	88	88	85	85	83	81	49	91	77	24	
18	77	73	70	70	69	70	69	69	65	58	52	47	41	39	36	40	48	58	61	61	54	53	55	53	36	77	58	24	
19	48	50	53	54	57	59	62	69	61	53	46	41	39	39	37	39	53	61	66	70	73	78	77	76	37	78	57	24	
20	75	78	78	82	84	89	90	91	89	85	79	76	76	72	68	67	69	72	71	71	74	73	73	72	67	91	77	24	
21	70	66	65	66	68	69	72	74	73	64	55	47	43	42	40	40	52	63	72	75	79	84	86	86	40	86	65	24	
22	87	88	89	89	89	89	89	89	88	86	78	62	52	48	45	51	62	63	69	78	83	86	89	87	45	89	77	24	
23	88	85	81	78	80	82	82	80	73	64	57	52	48	47	47	48	51	57	64	67	65	66	65	63	47	88	66	24	
24	63	62	62	58	60	62	66	63	55	45	42	42	41	46	41	41	36	36	42	50	58	62	65	67	36	67	53	24	
25	69	78	84	86	90	91	91	91	91	91	91	91	91	91	90	89	89	89	88	88	87	85	86	87	69	91	88	24	
26	88	89	89	88	89	89	89	88	88	83	78	73	72	73	72	73	73	73	75	76	78	80	82	80	72	89	81	24	
27	82	83	83	85	88	89	90	90	89	78	68	64	61	61	64	65	74	76	67	66	68	71	73	72	61	90	75	24	
28	75	77	78	81	82	81	80	75	73	67	60	52	51	50	54	56	59	61	61	57	60	69	75	67	50	82	67	24	
29	62	66	65	61	67	64	74	87	75	74	81	66	59	49	50	51	53	58	62	66	71	80	83	79	49	87	67	24	
30	78	77	76	74	76	78	77	79	77	71	69	68	66	65	64	65	67	73	75	79	85	87	88	88	64	88	75	24	
31	88	88	88	87	87	88	86	85	85	85	85	84	82	83	85	86	88	89	89	89	88	89	88	88	82	89	87	24	
HOURLY MAX	88	90	90	91	91	91	91	91	91	91	91	91	91	91	91	90	89	89	89	90	90	90	90	89	89				
HOURLY AVG	77	78	78	78	79	79	80	80	76	71	67	64	62	60	59	59	62	66	69	72	74	76	78	77					

STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

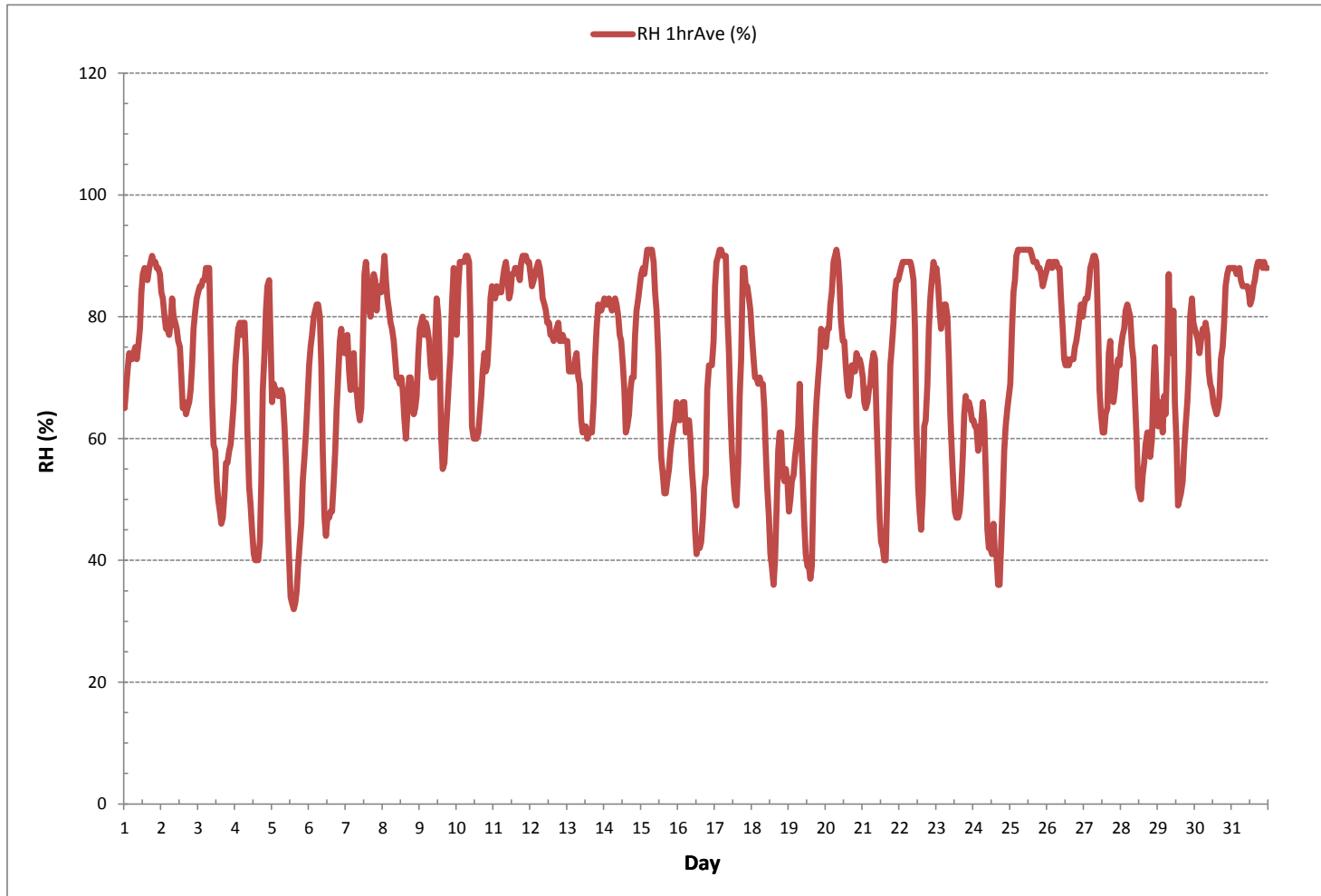
24 HR AVERAGES October 2017



MONTHLY SUMMARY

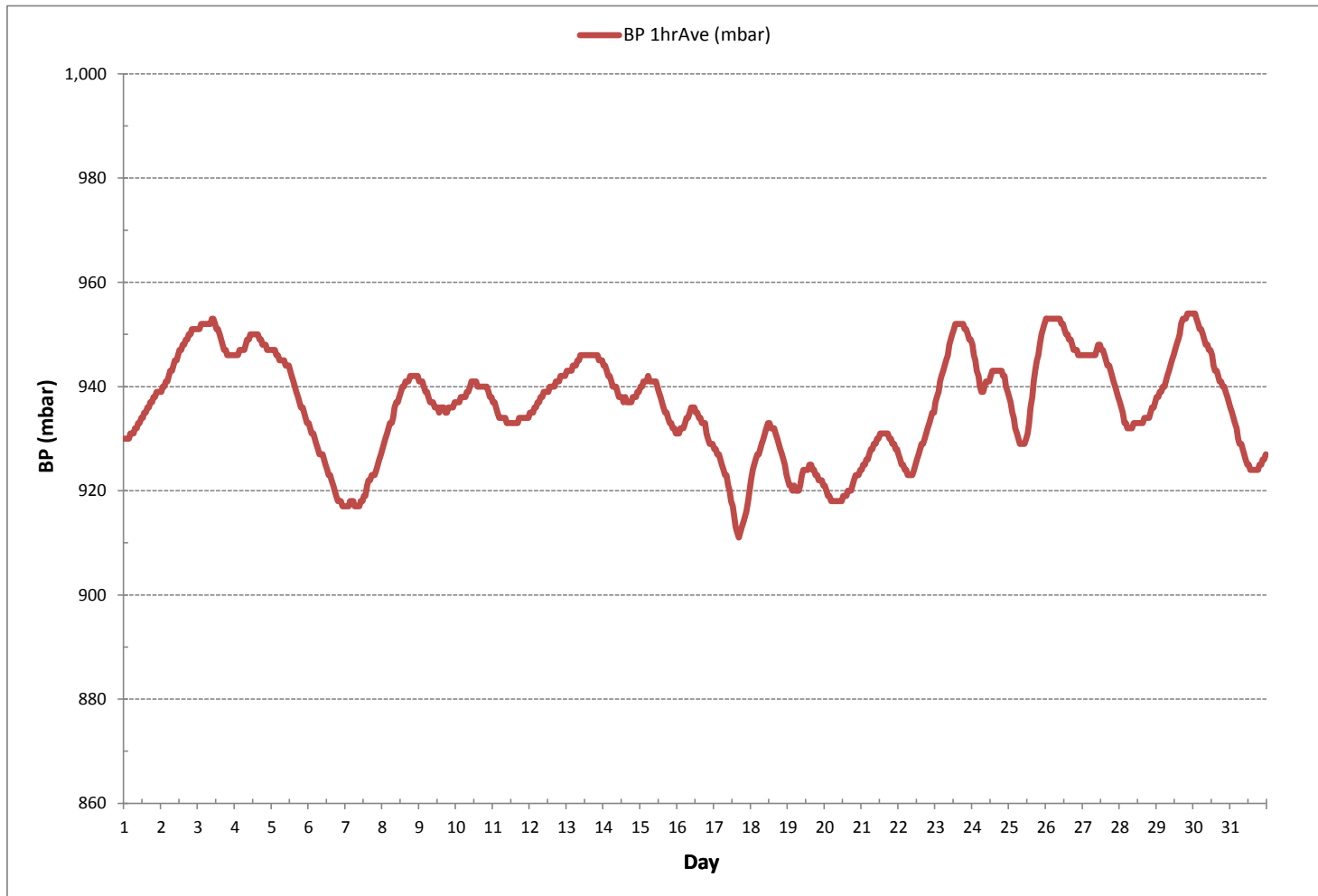
MINIMUM 1-HR AVERAGE:	32	%	@ HOUR	14	ON DAY	5
MAXIMUM 1-HR AVERAGE:	91	%	@ HOUR	4	ON DAY	15
MAXIMUM 24-HR AVERAGE:	88	%			ON DAY	25
OPERATIONAL TIME:						744 hrs
AMD OPERATION UPTIME:						100.0 %
STANDARD DEVIATION:	14	MONTHLY AVERAGE:				72 %

RELATIVE HUMIDITY Hourly Averages (RH %)



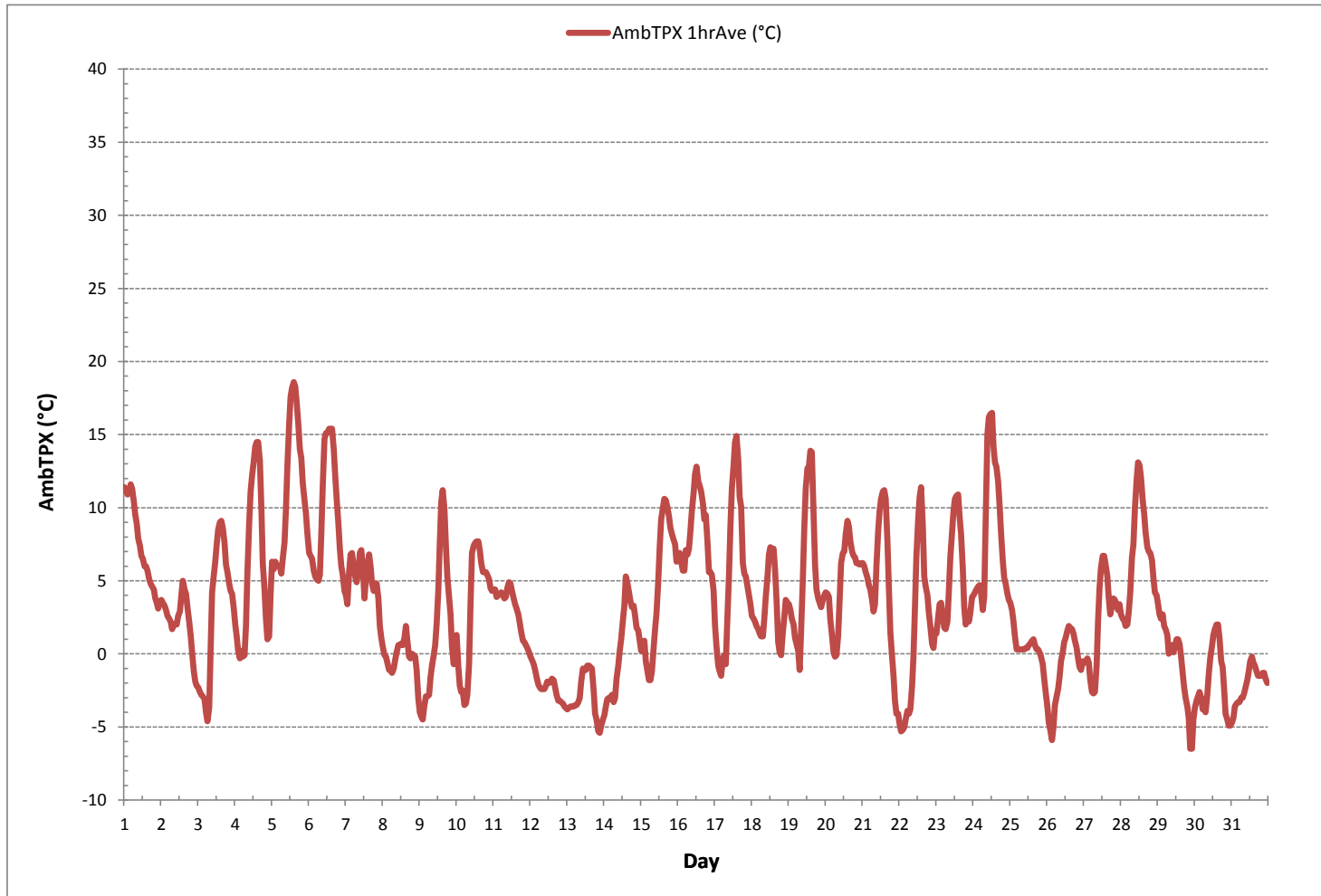
BAROMETRIC PRESSURE

BAROMETRIC PRESSURE Hourly Averages (BP mbar)



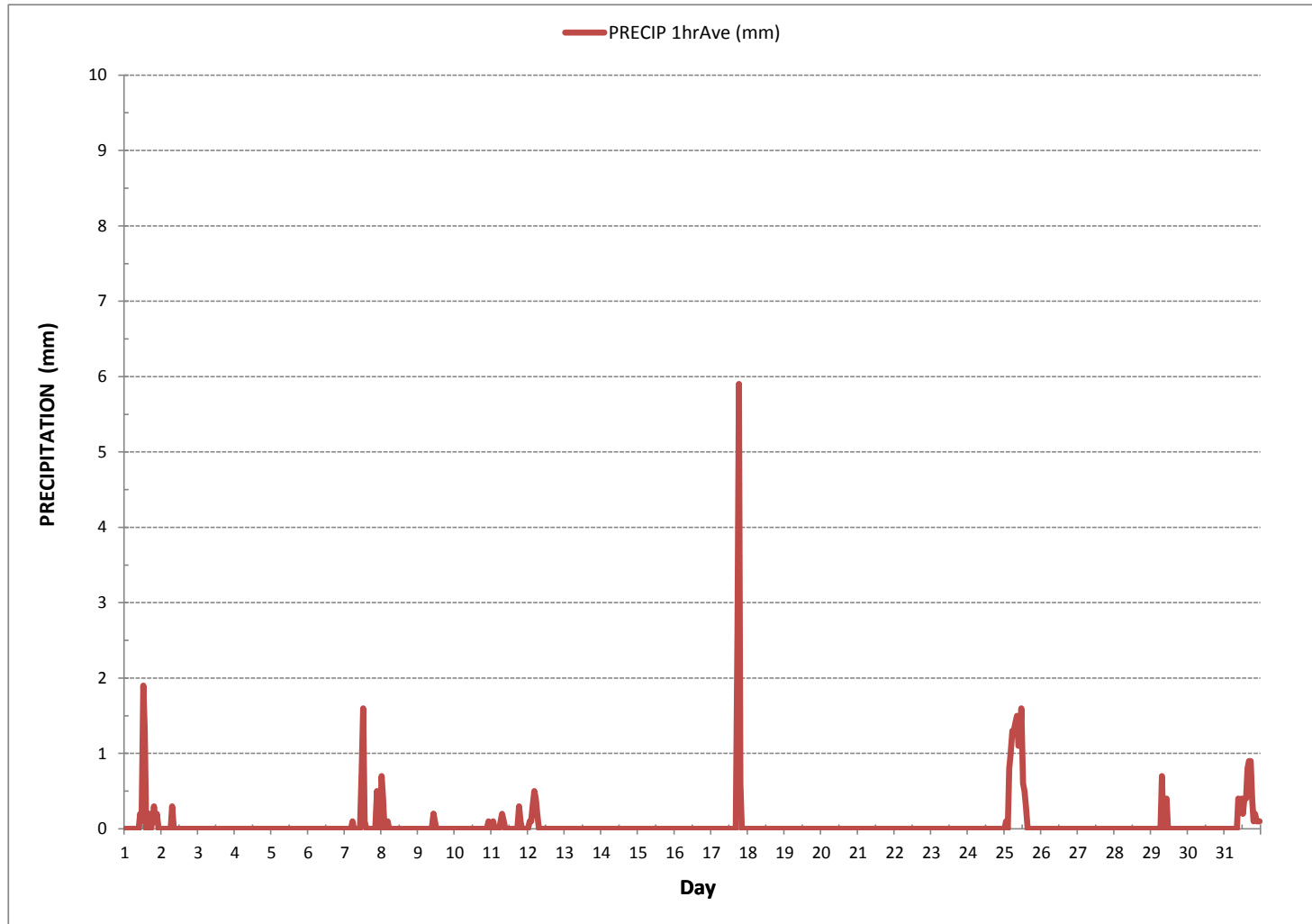
AMBIENT TEMPERATURE

AMBIENT TEMPERATURE Hourly Averages (AmbTPX °C)



PRECIPITATION

PRECIPITATION Hourly Averages (mm)



APPENDIX II
EQUIPMENT CALIBRATION RESULTS

SULPHUR DIOXIDE



API 100E Sulphur Dioxide Analyzer Calibration

Date:	October 3, 2017	Barometer/B.P./units:	F.S. 05544 expires December 5, 2018	951	millibars
Company/Airshed:	LICA	Thermometer/Station Temp:	F.S. 170286131 expires April 19, 2019	22	°C
Location/Station Name:	Maskwa	Weather Conditions:	Mainly sunny		
Parameter:	Sulphur Dioxide	Calibration Purpose:	routine monthly		
Start Time 24 hr. (mst):	10:16	Performed By/Reviewer:	Alex Yakupov	Tom Bourque	
End Time 24 hr. (mst):	14:38	Cal Gas Expiry Date:	July 18, 2019		
Calibration Method:	Gas Dilution	Converter Model & s/n (if applicable):	n/a		

Analyzer:	Range ppb:
ID# or Serial Number:	508
Last Calibration Date:	September 7, 2017
Previous C.F.:	0.999
	As Found C.F.:
	0.960
	New C.F.:
	1.000

Calibration Standards:	Standard Calibration Points for Ranges
Low Flow Meter ID/Expiry Date:	Defender Low 152020 expires November 21, 2017
High Flow Meter ID/Expiry Date:	Defender High 148943 expires November 21, 2017
Calibrator ID/Expiry Date:	API id# 627 expires January 27, 2018
Cal Gas Cylinder I.D. # :	LL104222
Cal Gas Conc. (ppm):	50.6

Point	ppb
High	780
Mid	380
Low	190

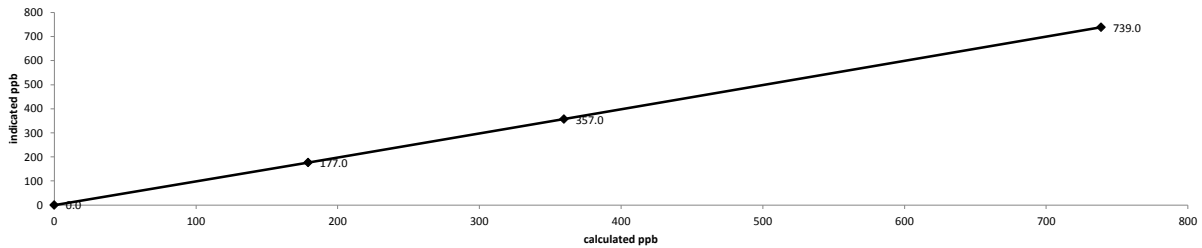
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Calibrator Flow Rates (cc/min)				Calculated Concentration (ppb):	Indicated Concentration (ppb):	Correction Factors (C.F.):
Point	Diluent	Cal Gas	Total			
as found zero	5194	0.00	5194	0.0	1.0	n/a
as found high	5238	77.62	5316	738.8	771.0	0.960
adjusted zero	5194	0.00	5194	0.0	0.0	n/a
adjusted high	5238	77.62	5316	738.8	739.0	1.000
mid	5263	37.68	5301	359.7	357.0	1.007
low	5282	18.77	5301	179.2	177.0	1.012
calibrator zero	5194	0.00	5194	0.0	0.0	n/a
Average C.F. =						1.006

Linear Regression/Calibration Results:

	LIMITS
Correlation Coefficient =	1.000 > or = 0.995
Slope =	0.999 0.95-1.05
b (Intercept as % of full scale) =	0.15% ± 3% F.S.
% change in C.F. from last cal =	3.95% ± 10%

API 100E Sulphur Dioxide Analyzer Calibration



	As found:		As left:
Slope:	0.949	Slope:	0.910
Offset:	150.3	Offset:	154.3
Hvps:	483	Hvps:	483
Rcell Temp:	50.0	Rcell Temp:	50.0
Box Temp:	30.5	Box Temp:	31.3
Pmt Temp:	7.6	Pmt Temp:	7.7
Izs Temp:	50.0	Izs Temp:	50.0
Pres:	25.0	Pres:	24.9
Samp Fl:	589	Samp Fl:	587
Norm Pmt:	151.0	Norm Pmt:	154.8
Uv Lamp:	2492.1	Uv Lamp:	2490.8
Lamp Ratio:	90.9	Lamp Ratio:	90.9
Str Lgt:	71.3	Str Lgt:	70.2
Drk Pmt:	-0.6	Drk Pmt:	-0.6
Expected Value:	479.0	Expected Value:	450.0

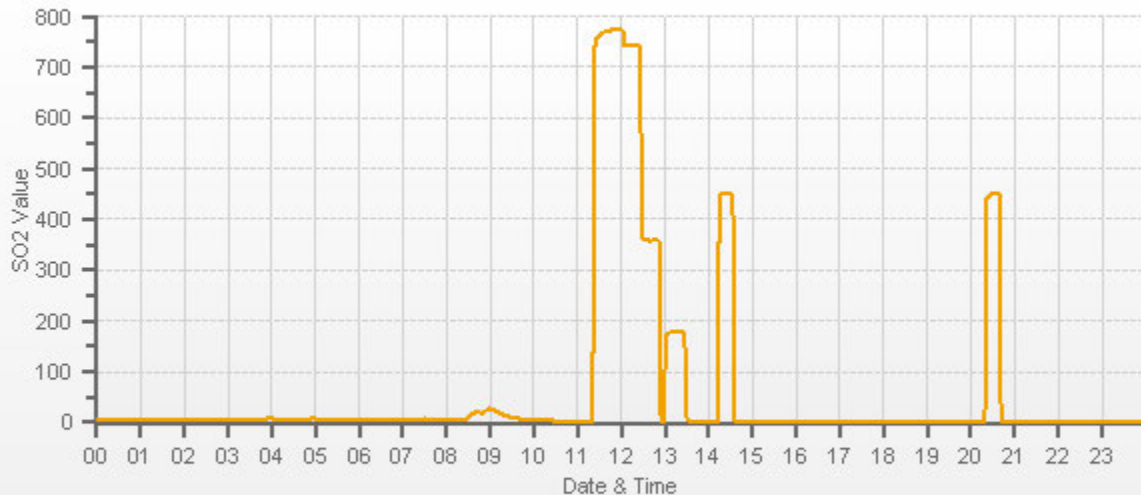
Comments:

The analyzer sample inlet filter was changed.

The manifold blower was found to be working normally.

Flow measurements after mid -point

SO2[ppb] Station: LICA MASKWA Daily: 17/10/03 Type: AVG 1 Min. [1 Min.]



— SO2[ppb]

HYDROGEN SULPHIDE



API 101E Hydrogen Sulphide Analyzer Calibration

Date: October 3, 2017	Barometer/B.P./units: F.S. 05544 expires December 5, 2018	951	millibars
Company/Airshed: LICA	Thermometer/Station Temp: F.S. 170286131 expires April 19, 2019	22	°C
Location/Station Name: Maskwa	Weather Conditions: Mainly sunny		
Parameter: Hydrogen Sulphide	Calibration Purpose: routine monthly		
Start Time 24 hr. (mst): 10:16	Performed By/Reviewer: Alex Yakupov		Tom Bourque
End Time 24 hr. (mst): 14:52	Cal Gas Expiry Date: June 14, 2019		
Calibration Method: Gas Dilution	Converter Model & s/n (if applicable): n/a		

Analyzer:	ID# or Serial Number: 722	Range ppb: 100	
	Last Calibration Date: September 6, 2017	As Found C.F.: 0.967	
	Previous C.F.: 1.000	New C.F.: 0.997	

Calibration Standards:	Standard Calibration Points for Ranges								
Low Flow Meter ID/Expiry Date: Defender Low 152020 expires November 21, 2017	<table border="1" style="margin: auto;"> <tr><th>Point</th><th>ppb</th></tr> <tr><td>High</td><td>78</td></tr> <tr><td>Mid</td><td>38</td></tr> <tr><td>Low</td><td>19</td></tr> </table>	Point	ppb	High	78	Mid	38	Low	19
Point	ppb								
High	78								
Mid	38								
Low	19								
High Flow Meter ID/Expiry Date: Defender High 148943 expires November 21, 2017									
Calibrator ID/Expiry Date: Sabio id# 11900613 expires March 16, 2018									
Cal Gas Cylinder I.D. # : EY 0000654									
Cal Gas Conc. (ppm): 10.2									

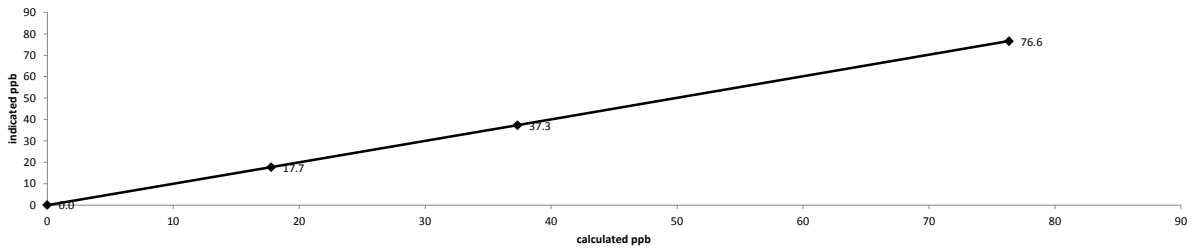
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Calibrator Flow Rates (cc/min)				Calculated Concentration (ppb):	Indicated Concentration (ppb):	Correction Factors (C.F.):
Point	Diluent	Cal Gas	Total			
as found zero	7952	0.00	7952	0.0	0.0	n/a
as found high	7881	59.44	7940	76.4	79.0	0.967
adjusted zero	7952	0.00	7952	0.0	0.0	n/a
adjusted high	7881	59.44	7940	76.4	76.6	0.997
mid	7910	29.06	7939	37.3	37.3	1.001
low	7914	13.82	7928	17.8	17.7	1.005
calibrator zero	7952	0.00	7952	0.0	0.0	n/a
Average C.F. =						1.001

Linear Regression/Calibration Results:

	LIMITS
Correlation Coefficient = 1.000	> or = 0.995
Slope = 0.996	0.95-1.05
b (Intercept as % of full scale) = 0.09%	± 3% F.S.
% change in C.F. from last cal = 3.34%	± 10%

API 101E Hydrogen Sulphide Analyzer Calibration



As found:	As left:
Slope: 0.874	Slope: 0.853
Offset: 102.3	Offset: 103.0
Hvps: 583	Hvps: 583
Rcell Temp: 50.0	Rcell Temp: 50.0
Box Temp: 30.6	Box Temp: 31.3
Pmt Temp: 8.2	Pmt Temp: 8.2
Izs Temp.: 32.0	Izs Temp.: 32.0
Converter Temp: 315.2	Converter Temp: 315.3
Pres: 23.6	Pres: 23.5
Samp Fl: 624	Samp Fl: 620
Uv Lamp: 3255.0	Uv Lamp: 3254.4
Lamp Ratio: 99.4	Lamp Ratio: 99.6
Str Lgt: 44.7	Str Lgt: 43.9
Drk Pmt: 24.9	Drk Pmt: 24.0
Expected Value: 73.9	Expected Value: 70.6

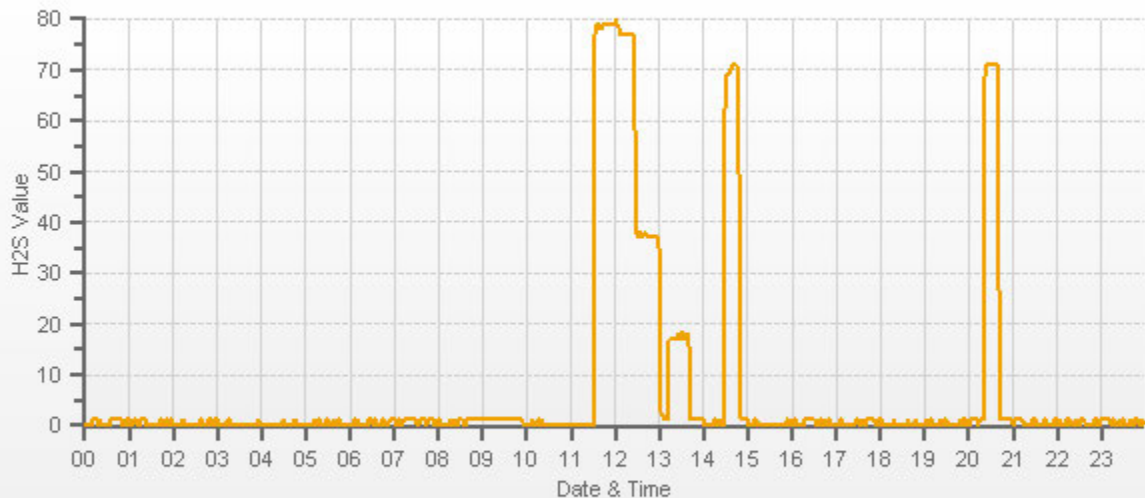
Comments:

The analyzer sample inlet filter was changed.

The manifold blower was found to be working normally.

Flow measurements after mid -point

H2S[ppb] Station: LICA MASKWA Daily: 17/10/03 Type: AVG 1 Min. [1 Min.]



— H2S[ppb]



API 101E Hydrogen Sulphide Analyzer Calibration

Date: <u>October 18, 2017</u>	Barometer/B.P./units: <u>F.S. 05544 expires December 5, 2018</u>	<u>932</u>	millibars
Company/Airshed: <u>LICA</u>	Thermometer/Station Temp: <u>F.S. 170286131 expires April 19, 2019</u>	<u>22</u>	°C
Location/Station Name: <u>Maskwa</u>	Weather Conditions: <u>Mainly sunny</u>		
Parameter: <u>Hydrogen Sulphide</u>	Calibration Purpose: <u>repeat</u>		
Start Time 24 hr. (mst): <u>13:21</u>	Performed By/Reviewer: <u>Alex Yakupov</u>	<u>Tom Bourque</u>	
End Time 24 hr. (mst): <u>17:24</u>	Cal Gas Expiry Date: <u>June 14, 2019</u>		
Calibration Method: <u>Gas Dilution</u>	Converter Model & s/n (if applicable): <u>n/a</u>		

Analyzer:	ID# or Serial Number: <u>722</u>	Range ppb: <u>100</u>	
	Last Calibration Date: <u>October 3, 2017</u>	As Found C.F.: <u>0.987</u>	
	Previous C.F.: <u>0.997</u>	New C.F.: <u>0.997</u>	

Calibration Standards: Low Flow Meter ID/Expiry Date: <u>Defender Low 152020 expires November 21, 2017</u> High Flow Meter ID/Expiry Date: <u>Defender High 148943 expires November 21, 2017</u> Calibrator ID/Expiry Date: <u>Sabio id# 11900613 expires March 16, 2018</u> Cal Gas Cylinder I.D. #: <u>EY 0000654</u> Cal Gas Conc. (ppm): <u>10.2</u>	Standard Calibration Points for Ranges <table border="1" style="margin: auto;"> <tr><td>Point</td><td>ppb</td></tr> <tr><td>High</td><td>78</td></tr> <tr><td>Mid</td><td>38</td></tr> <tr><td>Low</td><td>19</td></tr> </table>	Point	ppb	High	78	Mid	38	Low	19
Point	ppb								
High	78								
Mid	38								
Low	19								

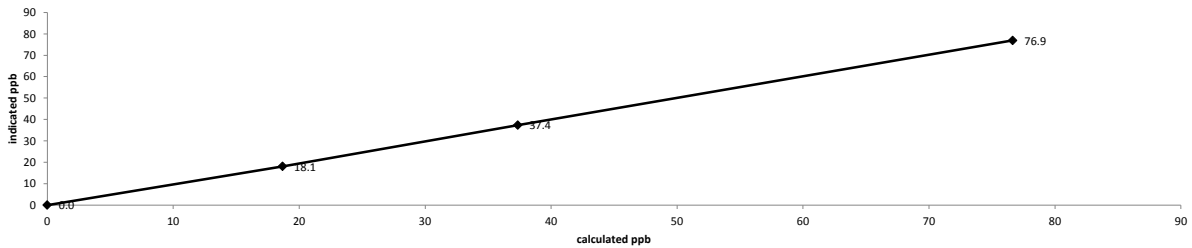
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Calibrator Flow Rates (cc/min)				Calculated Concentration (ppb):	Indicated Concentration (ppb):	Correction Factors (C.F.):
Point	Diluent	Cal Gas	Total			
as found zero	7891	0.00	7891	0.0	1.9	n/a
as found high	7816	59.18	7875	76.7	79.6	0.987
adjusted zero	7891	0.00	7891	0.0	0.0	n/a
adjusted high	7816	59.18	7875	76.7	76.9	0.997
mid	7895	29.02	7924	37.4	37.4	0.999
low	7903	14.50	7917	18.7	18.1	1.032
calibrator zero	7891	0.00	7891	0.0	0.0	n/a
Average C.F. =						1.009

Linear Regression/Calibration Results:

Correlation Coefficient =	<u>1.000</u>	LIMITS
		> or = 0.995
Slope =	<u>0.994</u>	0.95-1.05
b (Intercept as % of full scale) =	<u>0.27%</u>	± 3% F.S.
% change in C.F. from last cal =	<u>1.05%</u>	± 10%

API 101E Hydrogen Sulphide Analyzer Calibration

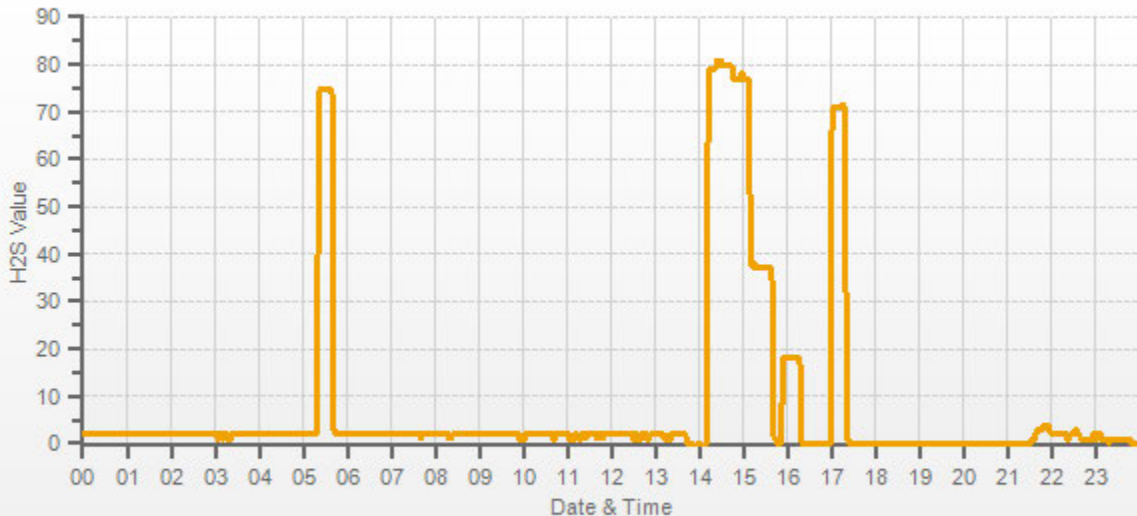


As found: Slope: <u>0.853</u> Offset: <u>103.0</u> Hvps: <u>583</u> Rcell Temp: <u>50.0</u> Box Temp: <u>29.7</u> Pmt Temp: <u>8.2</u> Izs Temp: <u>32.0</u> Converter Temp: <u>315.2</u> Pres: <u>22.9</u> Samp Fl: <u>606</u> Uv Lamp: <u>3243.3</u> Lamp Ratio: <u>99.3</u> Str Lgt: <u>43.9</u> Drk Pmt: <u>23.3</u> Expected Value: <u>70.6</u>	As left: Slope: <u>0.843</u> Offset: <u>107.4</u> Hvps: <u>583</u> Rcell Temp: <u>50.0</u> Box Temp: <u>30.7</u> Pmt Temp: <u>8.2</u> Izs Temp: <u>32.0</u> Converter Temp: <u>315.2</u> Pres: <u>22.9</u> Samp Fl: <u>607</u> Uv Lamp: <u>3251.1</u> Lamp Ratio: <u>99.5</u> Str Lgt: <u>45.3</u> Drk Pmt: <u>23.6</u> Expected Value: <u>73.5</u>
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Comments:

The SO2 scrubber check was not performed, see comments below. The SO2 scrubber check was performed earlier in October.
 The manifold blower was found to be working normally. Repeat calibration was completed to correct ZERO drift.

Flow measurements after mid -point



— H2S[ppb]



API 101E Hydrogen Sulphide Analyzer Calibration

Date: <u>October 27, 2017</u>	Barometer/B.P./units: <u>F.S. 05544 expires December 5, 2018</u> <u>947</u> <u>millibars</u>
Company/Airshed: <u>LICA</u>	Thermometer/Station Temp: <u>F.S. 170286131 expires April 19, 2019</u> <u>22</u> <u>°C</u>
Location/Station Name: <u>Maskwa</u>	Weather Conditions: <u>Mix of sun and clouds</u>
Parameter: <u>Hydrogen Sulphide</u>	Calibration Purpose: <u>repeat</u>
Start Time 24 hr. (mst): <u>12:01</u>	Performed By/Reviewer: <u>Alex Yakupov</u> <u>Tom Bourque</u>
End Time 24 hr. (mst): <u>15:49</u>	Cal Gas Expiry Date: <u>June 14, 2019</u>
Calibration Method: <u>Gas Dilution</u>	Converter Model & s/n (if applicable): <u>n/a</u>

Analyzer:	Range ppb: <u>100</u>
ID# or Serial Number: <u>722</u>	As Found C.F.: <u>1.001</u>
Last Calibration Date: <u>October 18, 2017</u>	New C.F.: <u>1.001</u>
Previous C.F.: <u>0.997</u>	

Calibration Standards:	Standard Calibration Points for Ranges								
Low Flow Meter ID/Expiry Date: <u>Defender Low 152020 expires November 21, 2017</u>	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><th>Point</th><th>ppb</th></tr> <tr><td>High</td><td>78</td></tr> <tr><td>Mid</td><td>38</td></tr> <tr><td>Low</td><td>19</td></tr> </table>	Point	ppb	High	78	Mid	38	Low	19
Point	ppb								
High	78								
Mid	38								
Low	19								
High Flow Meter ID/Expiry Date: <u>Defender High 148943 expires November 21, 2017</u>									
Calibrator ID/Expiry Date: <u>Sabio id# 11900613 expires March 16, 2018</u>									
Cal Gas Cylinder I.D. # : <u>EY 0000654</u>									
Cal Gas Conc. (ppm): <u>10.2</u>									

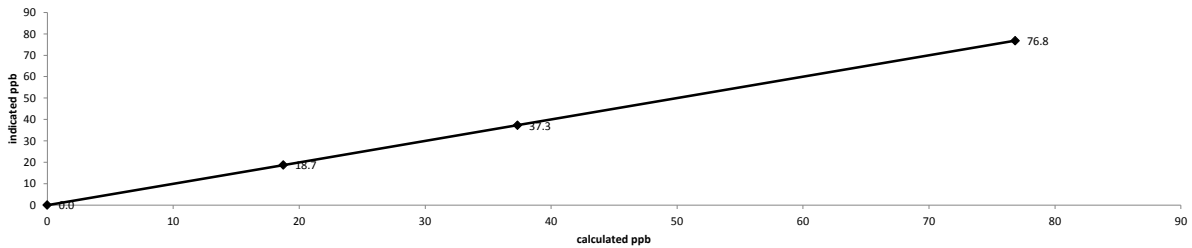
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Calibrator Flow Rates (cc/min)				Calculated	Indicated Concentration (ppb):	Correction Factors (C.F.):
Point	Diluent	Cal Gas	Total	Concentration (ppb):		
as found zero	7864	0.00	7864	0.0	-1.0	n/a
as found high	7796	59.18	7855	76.8	75.8	1.001
adjusted zero	7864	0.00	7864	0.0	0.0	n/a
adjusted high	7796	59.18	7855	76.8	76.8	1.001
mid	7868	28.91	7897	37.3	37.3	1.001
low	7873	14.49	7887	18.7	18.7	1.002
calibrator zero	7864	0.00	7864	0.0	0.0	n/a
Average C.F. =						1.001

Linear Regression/Calibration Results:

Correlation Coefficient =	<u>1.000</u>	LIMITS	
		> or = 0.995	
Slope =	<u>1.001</u>	0.95-1.05	
b (Intercept as % of full scale) =	<u>0.01%</u>	± 3% F.S.	
% change in C.F. from last cal =	<u>-0.36%</u>	± 10%	

API 101E Hydrogen Sulphide Analyzer Calibration

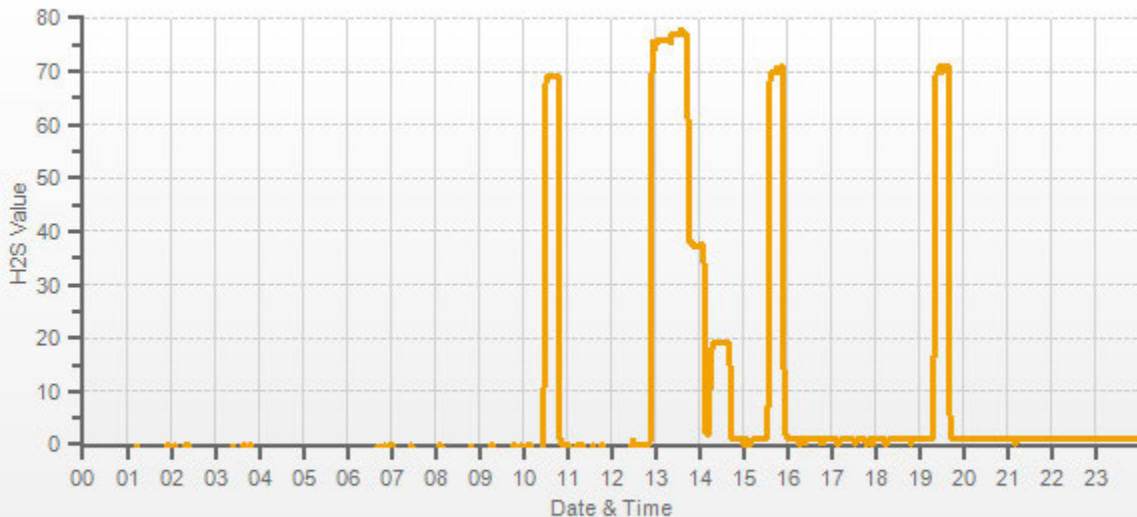


As found:	As left:
Slope: <u>0.843</u>	Slope: <u>0.839</u>
Offset: <u>107.4</u>	Offset: <u>104.3</u>
Hvps: <u>583</u>	Hvps: <u>583</u>
Rcell Temp: <u>50.0</u>	Rcell Temp: <u>50.0</u>
Box Temp: <u>31.5</u>	Box Temp: <u>32.1</u>
Pmt Temp: <u>8.2</u>	Pmt Temp: <u>8.2</u>
Izs Temp.: <u>32.0</u>	Izs Temp.: <u>32.0</u>
Converter Temp: <u>314.9</u>	Converter Temp: <u>314.6</u>
Pres: <u>23.4</u>	Pres: <u>23.4</u>
Samp Fl: <u>617</u>	Samp Fl: <u>616</u>
Uv Lamp: <u>3245.5</u>	Uv Lamp: <u>3244.5</u>
Lamp Ratio: <u>99.4</u>	Lamp Ratio: <u>99.2</u>
Str Lgt: <u>45.3</u>	Str Lgt: <u>43.7</u>
Drk Pmt: <u>24.1</u>	Drk Pmt: <u>24.3</u>
Expected Value: <u>73.5</u>	Expected Value: <u>70.4</u>

Comments:

The SO2 scrubber check was not performed, see comments below.
 The manifold blower was found to be working normally.
 The SO2 scrubber was checked during this month's previous calibration.
 The Repeat calibration was completed to correct negative drift of ZERO and the EV.

Flow measurements after mid -point



— H2S[ppb]

TOTAL HYDROCARBON



Thermo 51C Total HydrocarbonTHC Analyzer Calibration

Date:	October 3, 2017	Barometer/B.P./units:	F.S. 05544 expires December 5, 2018	951	millibars
Company/Airshed:	LICA	Thermometer/Station Temp:	F.S. 170286131 expires April 19, 2019	22	°C
Location/Station Name:	Maskwa	Weather Conditions:	Mainly sunny		
Parameter:	Total Hydrocarbon	Calibration Purpose:	routine monthly		
Start/End Time 24 hr. (mst):	14:08 / 17:58	Performed By/Reviewer:	Alex Yakupov	Tom Bourque	
Calibration Method:	Gas Dilution	Cal Gas Expiry Date:	November 25, 2023		

Analyzer:	Range ppm:
ID# or Serial Number:	50
Last Calibration Date:	As Found C.F.:
September 7, 2017	0.998
Previous Cal High Point C.F.:	New C.F.:
1.000	1.000

Calibration Standards:									
Low Flow Meter ID/Expiry Date: Defender Low 152020 expires November 21, 2017 High Flow Meter ID/Expiry Date: Defender High 148943 expires November 21, 2017 Calibrator ID/Expiry Date: Sabio id# 11900613 expires March 16, 2018 Cal Gas Cylinder I.D. #: LL165372	Standard Calibration Points for a Range of: 50 ppm								
CH ₄ /C ₃ H ₈ Cylinder Conc. (ppm): 606.0 212.0 CH ₄ as propane/total CH ₄ equivalents (ppm): 583.0 1189.0	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>Point</th> <th>Target ppm</th> </tr> <tr> <td>High</td> <td style="text-align: center;">38</td> </tr> <tr> <td>Mid</td> <td style="text-align: center;">18</td> </tr> <tr> <td>Low</td> <td style="text-align: center;">9</td> </tr> </table>	Point	Target ppm	High	38	Mid	18	Low	9
Point	Target ppm								
High	38								
Mid	18								
Low	9								

ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

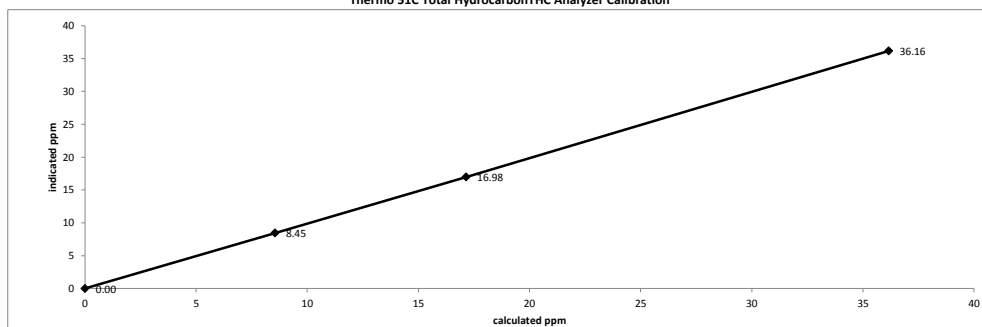
Point	Calibrator Flow Rates (cc/min)			Calculated Concentration: (ppm)	Indicated Concentration: (ppm)	Correction Factors:
	Diluent	Cal Gas	Total			
as found zero	2071	0.00	2071	0.0	0.47	n/a
as found high	2012	63.10	2075	36.16	36.70	0.998
adjusted zero	2071	0.00	2071	0.00	0.00	n/a
adjusted high	2012	63.10	2075	36.16	36.16	1.000
mid	2045	29.93	2075	17.15	16.98	1.010
low	2067	14.97	2082	8.55	8.45	1.012
calibrator zero	2071	0.00	2071	0.0	0.00	n/a

Average C.F.= 1.007

Linear Regression/Calibration Results:

Correlation Coefficient =	1.000	LIMITS
Slope =	0.999	> or = 0.995
b (Intercept as % of full scale)=	0.15%	0.95-1.05
% change in C.F. from last cal=	0.20%	± 3% F.S.
		± 10%

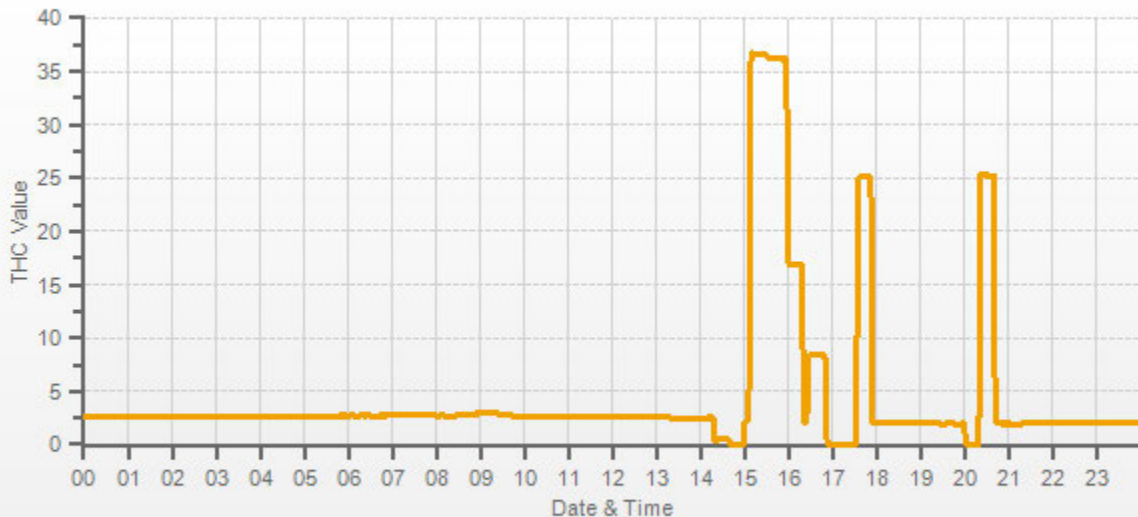
Thermo 51C Total HydrocarbonTHC Analyzer Calibration



As found: H2 cylinder (psi): 1000 H2 cylinder reg set (psi): 22 Span Cylinder (psi): 500 Span Cylinder Reg Set (psi): 25 Zero Air Gen Pressure: 37 measurement alarms: None service alarms: None cnt: 3361 rng: 1 try: 0 flm: 218.0 det: 125.8 Flame: 2180 Filter: 125 Base: 125 Sample psi: 06.83 Internal Air Pressure: 20 Internal Fuel Pressure: 13 Measured Flow: 1.012 Expected Value: 26.11	As left: H2 cylinder (psi): 1000 H2 cylinder reg set (psi): 22 Span Cylinder (psi): 500 Span Cylinder Reg Set (psi): 25 Zero Air Gen Pressure: 37 measurement alarms: None service alarms: None cnt: 3355 rng: 1 try: 0 flm: 217.8 det: 125.8 Flame: 217 Filter: 125 Base: 125 Sample psi: 06.83 Internal Air Pressure: 20 Internal Fuel Pressure: 13 Measured Flow: n/a Expected Value: 25.12
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Comments:
 The analyzer sample inlet filter was changed.
 The analyzer cooling fan filter(s) were cleaned.
 The manifold blower was found to be working normally.

Flow measurements after mid -point



— THC[ppm]



Thermo 51C Total Hydrocarbon Analyzer Calibration

Date:	October 26, 2017	Barometer/B.P./units:	F.S. 05544 expires December 5, 2018	950	millibars
Company/Airshed:	LICA	Thermometer/Station Temp:	F.S. 170286131 expires April 19, 2019	22	°C
Location/Station Name:	Maskwa	Weather Conditions:	Light snow		
Parameter:	Total Hydrocarbon	Calibration Purpose:	repeat		
Start/End Time 24 hr. (mst):	13:39 / 17:33	Performed By/Reviewer:	Alex Yakupov	Tom Bourque	
Calibration Method:	Gas Dilution	Cal Gas Expiry Date:	November 25, 2023		

Analyzer:	Range ppm:
ID# or Serial Number:	50
Last Calibration Date:	As Found C.F.:
October 3, 2017	0.995
Previous Cal High Point C.F.:	New C.F.:
1.000	0.999

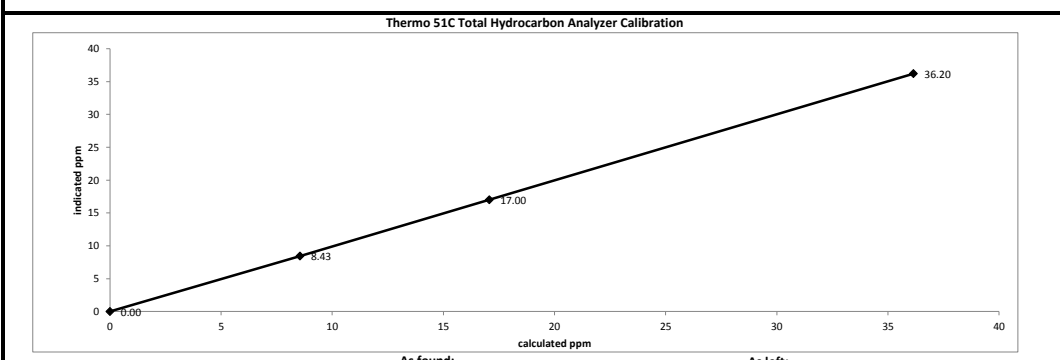
Calibration Standards:									
Low Flow Meter ID/Expiry Date: Defender Low 152020 expires November 21, 2017 High Flow Meter ID/Expiry Date: Defender High 148943 expires November 21, 2017 Calibrator ID/Expiry Date: Sabio id# 11900613 expires March 16, 2018 Cal Gas Cylinder I.D. #: LL 165372 CH ₄ /C ₃ H ₈ Cylinder Conc. (ppm): 606.0 212.0 CH ₄ as propane/total CH ₄ equivalents (ppm): 583.0 1189.0	Standard Calibration Points for a Range of: 50 ppm <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>Point</th> <th>Target ppm</th> </tr> <tr> <td>High</td> <td style="text-align: center;">38</td> </tr> <tr> <td>Mid</td> <td style="text-align: center;">18</td> </tr> <tr> <td>Low</td> <td style="text-align: center;">9</td> </tr> </table>	Point	Target ppm	High	38	Mid	18	Low	9
Point	Target ppm								
High	38								
Mid	18								
Low	9								

ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Point	Calibrator Flow Rates (cc/min)			Calculated Concentration: (ppm)	Indicated Concentration: (ppm)	Correction Factors:
	Diluent	Cal Gas	Total			
as found zero	2068	0.00	2068	0.0	0.26	n/a
as found high	2006	62.90	2069	36.15	36.58	0.995
adjusted zero	2068	0.00	2068	0.00	0.00	n/a
adjusted high	2006	62.90	2069	36.15	36.20	0.999
mid	2048	29.83	2078	17.07	17.00	1.004
low	2069	14.99	2084	8.55	8.43	1.015
calibrator zero	2068	0.00	2068	0.0	0.00	n/a
Average C.F.=						1.006

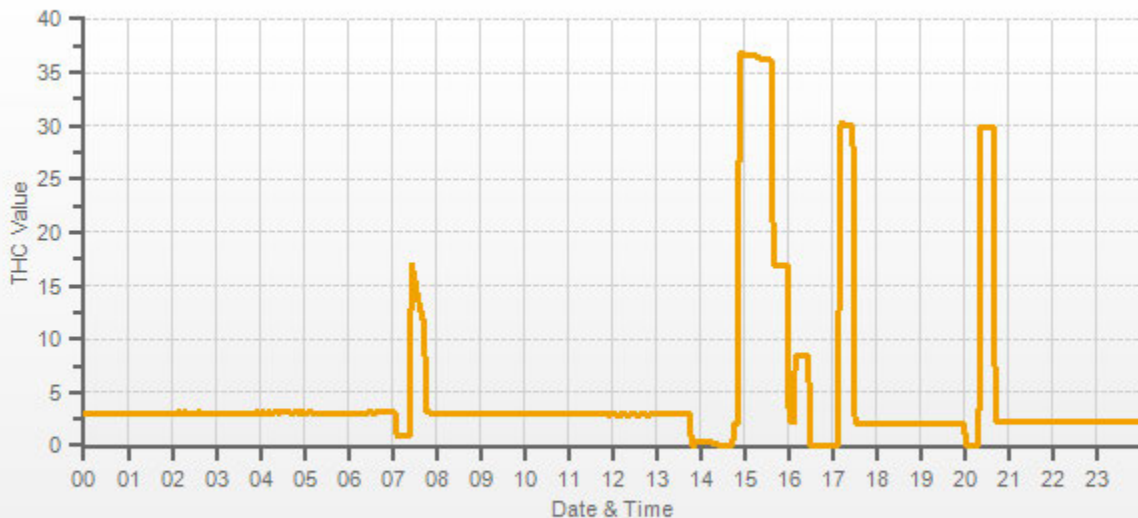
Linear Regression/Calibration Results:

Correlation Coefficient = <u>1.000</u>	LIMITS
Slope = <u>0.997</u>	> or = 0.995
b (Intercept as % of full scale) = <u>0.15%</u>	0.95-1.05
% change in C.F. from last cal = <u>0.48%</u>	± 3% F.S.
	± 10%



H2 cylinder (psi): <u>700</u> H2 cylinder reg set (psi): <u>25</u> Span Cylinder (psi): <u>0.0</u> Span Cylinder Reg Set (psi): <u>22</u> Zero Air Gen Pressure: <u>38</u> measurement alarms: <u>None</u> service alarms: <u>None</u> cnt: <u>3937</u> rng: <u>1</u> try: <u>0</u> flm: <u>217.0</u> det: <u>125.6</u> Flame: <u>218</u> Filter: <u>125</u> Base: <u>125</u> Sample psi: <u>06.82</u> Internal Air Pressure: <u>21</u> Internal Fuel Pressure: <u>12</u> Measured Flow: <u>1.016</u> Expected Value: <u>25.12</u>	H2 cylinder (psi): <u>700</u> H2 cylinder reg set (psi): <u>25</u> Span Cylinder (psi): <u>2000</u> Span Cylinder Reg Set (psi): <u>22</u> Zero Air Gen Pressure: <u>38</u> measurement alarms: <u>None</u> service alarms: <u>None</u> cnt: <u>3405</u> rng: <u>1</u> try: <u>0</u> flm: <u>216.8</u> det: <u>125.7</u> Flame: <u>216</u> Filter: <u>125</u> Base: <u>125</u> Sample psi: <u>06.83</u> Internal Air Pressure: <u>21</u> Internal Fuel Pressure: <u>12</u> Measured Flow: <u>n/a</u> Expected Value: <u>30.10</u>
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Comments:
 A new span gas cylinder was installed.
 The manifold blower was found to be working normally.
 Repeat calibration was completed to correct ZERO drift and adjust the EV.
 Flow measurements after mid -point



— THC[ppm]

NITROGEN DIOXIDE



Thermo 42C NO-NO2-NOx Analyzer Calibration

Date: October 3, 2017	Barometer/B.P./units: F.S. 05544 expires December 5, 2018	951	millibars
Company/Airshed: LICA	Thermometer/Station Temp: F.S. 170286131 expires April 19, 2019	22	°C
Location/Station Name: Maskwa	Weather Conditions: Mainly sunny		
Start/End Time 24 hr. (mst): 10:16 / 16:46	Calibration Purpose: routine monthly		
G.P.T. to be used for Ozone? No	Performed By/Reviewer: Alex Yakupov Tom Bourque		
Calibration Method: Gas Dilution & Gas Phase Titration	Cal Gas Expiry Date: July 18, 2019		

Analyzer:	Correction Factors:												
ID# or Serial Number: 42CLT-65974-351	Previous C.F.:												
Last Calibration Date: September 11, 2017	As Found C.F.:												
Range ppb: 1000	New C.F.:												
	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>NO =</td> <td>1.001</td> <td>0.925</td> <td>1.000</td> </tr> <tr> <td>NO₂ =</td> <td>1.000</td> <td>1.000</td> <td>1.000</td> </tr> <tr> <td>NOx =</td> <td>1.001</td> <td>0.948</td> <td>1.000</td> </tr> </table>	NO =	1.001	0.925	1.000	NO ₂ =	1.000	1.000	1.000	NOx =	1.001	0.948	1.000
NO =	1.001	0.925	1.000										
NO ₂ =	1.000	1.000	1.000										
NOx =	1.001	0.948	1.000										

Calibration Standards:	Standard Calibration Points for a Range of: 1000 ppb																								
Low Flow Meter ID/Expiry Date: Defender Low 152020 expires November 21, 2017	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Point</th> <th>Target NO (ppb)</th> <th>Target NO₂ (ppb)</th> <th>Cc Ozone ?</th> </tr> </thead> <tbody> <tr> <td>High</td> <td>780</td> <td>500</td> <td>n/a</td> </tr> <tr> <td>Mid</td> <td>380</td> <td>275</td> <td>n/a</td> </tr> <tr> <td>Low</td> <td>190</td> <td>100</td> <td>n/a</td> </tr> <tr> <td>Extra Point #1</td> <td>n/a</td> <td>n/a</td> <td>n/a</td> </tr> <tr> <td>Extra Point #2</td> <td>n/a</td> <td>n/a</td> <td>n/a</td> </tr> </tbody> </table>	Point	Target NO (ppb)	Target NO ₂ (ppb)	Cc Ozone ?	High	780	500	n/a	Mid	380	275	n/a	Low	190	100	n/a	Extra Point #1	n/a	n/a	n/a	Extra Point #2	n/a	n/a	n/a
Point		Target NO (ppb)	Target NO ₂ (ppb)	Cc Ozone ?																					
High		780	500	n/a																					
Mid		380	275	n/a																					
Low		190	100	n/a																					
Extra Point #1	n/a	n/a	n/a																						
Extra Point #2	n/a	n/a	n/a																						
High Flow Meter ID/Expiry Date: Defender High 148943 expires November 21, 2017																									
Calibrator ID/Expiry Date: API id# 627 expires January 27, 2018																									
Cal Gas Cylinder I.D. #: LL104222																									
Cal Gas Conc. (ppm): 50.7 50.7																									

ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Point	Diluent	Cal Gas	Total Flow	Calculated NO (ppb)	Calculated NOx (ppb)	Indicated NO (ppb)	Indicated NOx (ppb)	NO C.F.	NOx C.F.
as found zero	5194	0.0	5194	0	0	-2.0	-2.0	n/a	n/a
as found high	5238	77.6	5316	740.3	740.3	798.0	779.0	0.925	0.948
adjusted zero	5194	0.00	5194	0.0	0.0	0.0	0.0	n/a	n/a
adjusted high	5238	77.62	5316	740.3	740.3	740.0	740.0	1.000	1.000
mid	5263	37.68	5301	360.4	360.4	354.0	354.0	1.018	1.018
low	5291	18.77	5310	179.2	179.2	174.0	174.0	1.030	1.030
calibrator zero	5194	0.00	5194	0	0	0.0	0.0	n/a	n/a
Average C.F.=								1.016	1.016

ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Point	Diluent	Cal Gas	Total Flow	Calibrator Setting (volts or ppb)	Indicated NO (ppb)	Indicated NOx (ppb)	Indicated NO ₂ (ppb)	NO drop (ppb)	NO ₂ gain (ppb)	NO ₂ C.F.
NOx reference	5238	77.62	5316	0.0	739.0	739.0	0.0	0.0	0.0	
as found high NO2	5238	77.62	5316	500.0	250.0	739.0	489.0	489.0	489.0	1.000
adjusted high NO2	5238	77.62	5316	500.0	250.0	739.0	489.0	489.0	489.0	1.000
gpt mid	5238	77.62	5316	280.0	463.0	739.0	276.0	276.0	276.0	1.000
gpt low	5238	77.62	5316	100.0	643.0	739.0	96.0	96.0	96.0	1.000
Average NO₂ C.F.=									1.000	

Linear Regression/Calibration Results:

	NO	NOx	NO ₂	LIMITS
Correlation Coefficient =	1.000	1.000	1.000	> or = 0.995
Slope =	0.999	0.999	1.000	0.95-1.05
b (Intercept as % of full scale) =	-0.34%	-0.34%	0.00%	± 3% F.S.
% change in C.F. from last cal =	7.56%	5.31%	0.00%	± 10%
NO2 converter efficiency			1.00	0.96 to 1.04

As found:		As left:	
NO Bkg ppb:	9.4	NO Bkg ppb:	6.9
NOx Bkg ppb:	9.7	NOx Bkg ppb:	7.3
NO Coef:	0.803	NO Coef:	0.745
NOx Coef:	1.008	NOx Coef:	1.032
NO2 Coef:	0.996	NO2 Coef:	0.996
PMT:	-660	PMT:	-659
Battery:	3.2	Battery:	3.2
Internal:	29.8	Internal:	30.7
Chamber:	50.1	Chamber:	50.6
Cooler:	-3.7	Cooler:	-3.7
Converter:	326	Converter:	327
Converter Set:	328	Converter Set:	328
Pressure:	242.4	Pressure:	241.4
Sample Flow:	1.000	Sample Flow:	1.000
Ozonator Flow:	OK	Ozonator Flow:	OK
Expected Value NO:	2	Expected Value NO:	1
Expected Value NO2:	207	Expected Value NO2:	209
Expected Value NOx:	209	Expected Value NOx:	210

Comments:

The analyzer sample inlet filter was changed.

The manifold blower was found to be working normally.

No high point NO2 adjustment was required/made. As found values were copied to adjusted high values for linearity calculation purposes.

The analyzer cooling fan filter(s) were cleaned.

The manifold blower was found to be working normally.

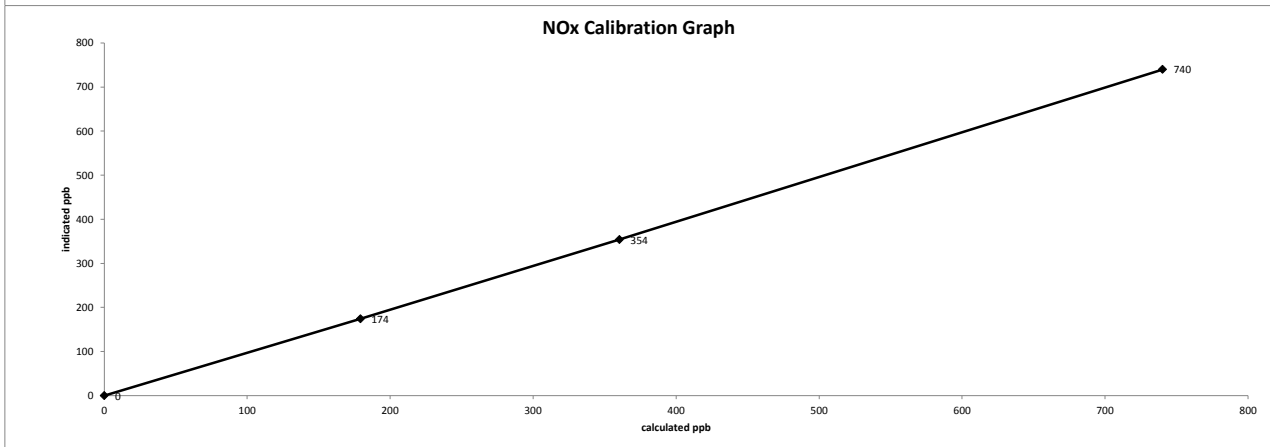
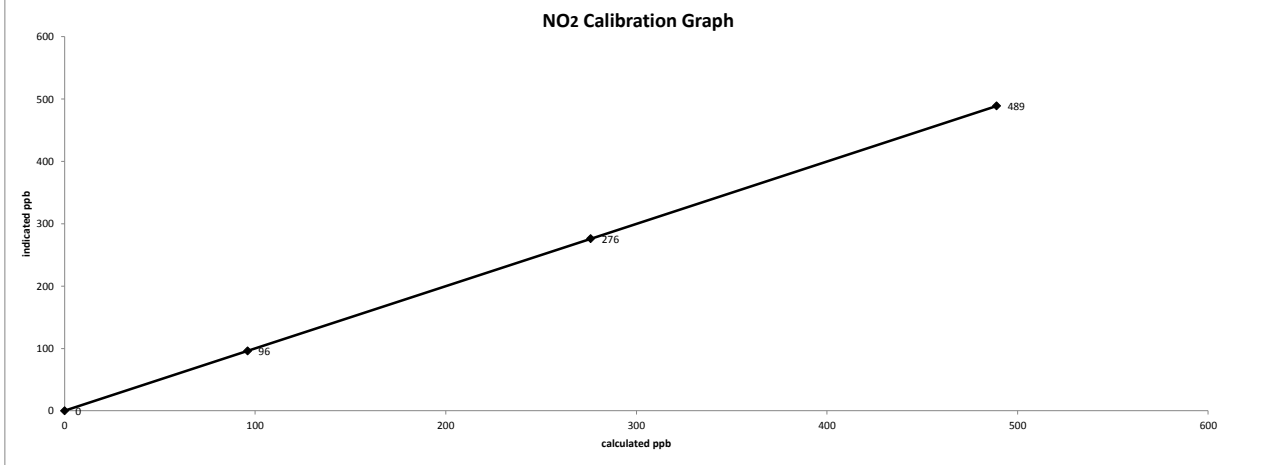
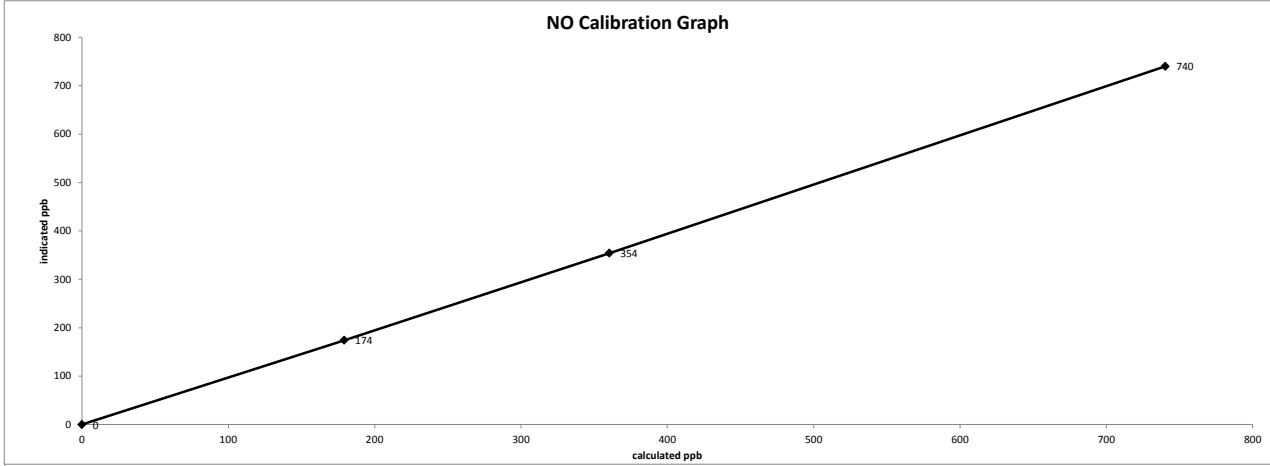
Flow measurements after mid -point

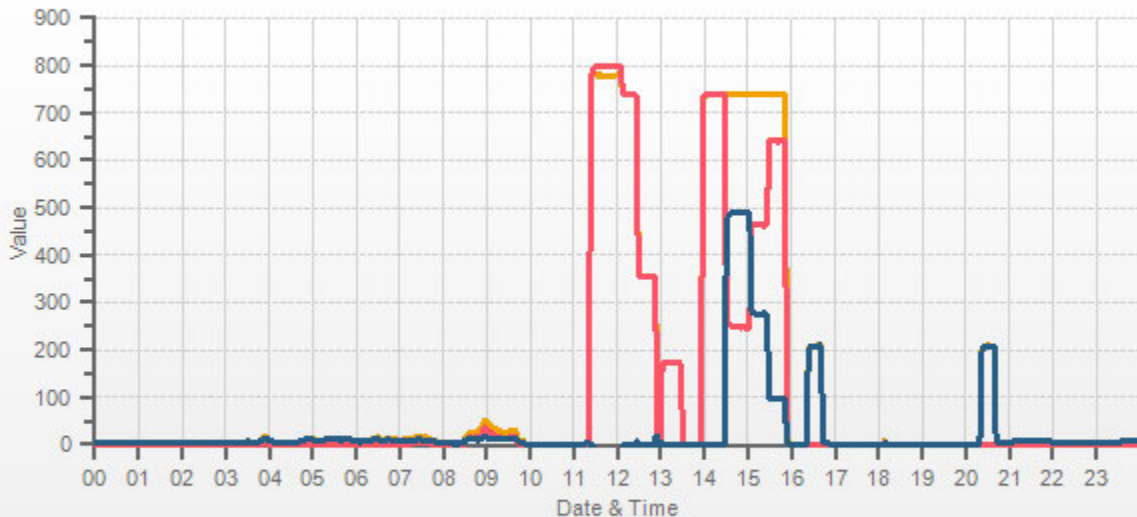
Calibration gas concentration (50.7 ppb) derived from original.

Date: October 3, 2017
Company/Airshed: LICA
Location/Station Name: Maskwa

Start/End Time 24 hr. (mst): 10:16 / 16:46
Calibration Purpose: routine monthly
Calibration Method: Gas Dilution & Gas Phase Titration

Thermo 42C NO-NO2-NOx Analyzer Calibration





— NOX[ppb] — NO[ppb] — NO2[ppb]



Thermo 42C NO-NO2-NOx Analyzer Calibration

Date: October 18, 2017	Barometer/B.P./units: F.S. 05544 expires December 5, 2018	932	millibars
Company/Airshed: LICA	Thermometer/Station Temp: F.S. 170286131 expires April 19, 2019	22	°C
Location/Station Name: Maskwa	Weather Conditions: Mainly sunny		
Start/End Time 24 hr. (mst): 13:21 / 17:25	Calibration Purpose: shut down		
G.P.T. to be used for Ozone? No	Performed By/Reviewer: Alex Yakupov		Tom Bourque
Calibration Method: Gas Dilution & Gas Phase Titration	Cal Gas Expiry Date: July 18, 2019		

Analyzer:	Correction Factors:
ID# or Serial Number: 42CLT-65974-351	Previous C.F.: NO = 1.000, NO ₂ = 1.000, NO _x = 1.000
Last Calibration Date: October 3, 2017	As Found C.F.: NO = 0.987, NO ₂ = 1.000, NO _x = 0.962
Range ppb: 1000	New C.F.: NO = n/a, NO ₂ = n/a, NO _x = n/a

Calibration Standards:	Standard Calibration Points for a Range of: 1000 ppb																								
Low Flow Meter ID/Expiry Date: Defender Low 152020 expires November 21, 2017	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Point</th> <th>Target NO (ppb)</th> <th>Target NO₂ (ppb)</th> <th>Cc Ozone ?</th> </tr> </thead> <tbody> <tr> <td>High</td> <td>780</td> <td>500</td> <td>n/a</td> </tr> <tr> <td>Mid</td> <td>380</td> <td>275</td> <td>n/a</td> </tr> <tr> <td>Low</td> <td>190</td> <td>100</td> <td>n/a</td> </tr> <tr> <td>Extra Point #1</td> <td>n/a</td> <td>n/a</td> <td>n/a</td> </tr> <tr> <td>Extra Point #2</td> <td>n/a</td> <td>n/a</td> <td>n/a</td> </tr> </tbody> </table>	Point	Target NO (ppb)	Target NO ₂ (ppb)	Cc Ozone ?	High	780	500	n/a	Mid	380	275	n/a	Low	190	100	n/a	Extra Point #1	n/a	n/a	n/a	Extra Point #2	n/a	n/a	n/a
Point		Target NO (ppb)	Target NO ₂ (ppb)	Cc Ozone ?																					
High		780	500	n/a																					
Mid		380	275	n/a																					
Low		190	100	n/a																					
Extra Point #1	n/a	n/a	n/a																						
Extra Point #2	n/a	n/a	n/a																						
High Flow Meter ID/Expiry Date: Defender High 148943 expires November 21, 2017																									
Calibrator ID/Expiry Date: API id# 627 expires January 27, 2018																									
Cal Gas Cylinder I.D. #: LL 104222																									
Cal Gas Conc. (ppm): 50.7 50.7																									

ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Point	Diluent	Cal Gas	Total Flow	Calculated NO (ppb)	Calculated NO _x (ppb)	Indicated NO (ppb)	Indicated NO _x (ppb)	NO C.F.	NO _x C.F.
as found zero	5163	0.0	5163	0	0	-1.0	-1.0	n/a	n/a
as found high	5208	78.4	5286	751.5	751.5	760.0	780.0	0.987	0.962
mid	5255	37.60	5293	360.2	360.2	359.0	367.0	1.000	0.979
low	5251	18.77	5270	180.6	180.6	176.0	180.0	1.020	0.998
Average C.F. =								1.003	0.980

ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Point	Diluent	Cal Gas	Total Flow	Calibrator Setting (volts or ppb)	Indicated NO (ppb)	Indicated NO _x (ppb)	Indicated NO ₂ (ppb)	NO drop (ppb)	NO ₂ gain (ppb)	NO _x C.F.
NO _x reference	5208	78.35	5286	0.0	760.0	774.0	14.0	-1.0	14.0	
as found high NO ₂	5208	78.35	5286	480.0	283.0	774.0	491.0	477.0	477.0	1.000
gpt mid	5208	78.35	5286	270.0	488.0	773.0	286.0	272.0	272.0	1.000
gpt low	5208	78.35	5286	90.0	671.0	774.0	103.0	89.0	89.0	1.000
Average NO₂ C.F. =										1.000

Linear Regression/Calibration Results:

	NO	NO _x	NO ₂	LIMITS
Correlation Coefficient =	1.000	1.000	1.000	> or = 0.995
Slope =	0.985	0.960	1.023	0.90-1.10
b (Intercept as % of full scale) =	-0.43%	-0.50%	0.87%	± 3% F.S.
% change in C.F. from last cal =	1.25%	0.00%	3.78%	± 10%
NO ₂ converter efficiency			1.00	0.96 to 1.04

	As found:		As left:
NO Bkg ppb:	6.9	NO Bkg ppb:	n/a
NO _x Bkg ppb:	7.3	NO _x Bkg ppb:	n/a
NO Coef:	0.745	NO Coef:	n/a
NO _x Coef:	1.032	NO _x Coef:	n/a
NO ₂ Coef:	0.996	NO ₂ Coef:	n/a
PMT:	-660	PMT:	n/a
Battery:	3.2	Battery:	n/a
Internal:	28.7	Internal:	n/a
Chamber:	50.2	Chamber:	n/a
Cooler:	-3.7	Cooler:	n/a
Converter:	327	Converter:	n/a
Converter Set:	328	Converter Set:	n/a
Pressure:	236.6	Pressure:	n/a
Sample Flow:	0.967	Sample Flow:	n/a
Ozonator Flow:	OK	Ozonator Flow:	n/a
Expected Value NO:	1	Expected Value NO:	n/a
Expected Value NO ₂ :	209	Expected Value NO ₂ :	n/a
Expected Value NO _x :	210	Expected Value NO _x :	n/a

Comments:

The manifold blower was found to be working normally.
No zero adjustment was required/made.

No high point NO₂ adjustment was required/made.

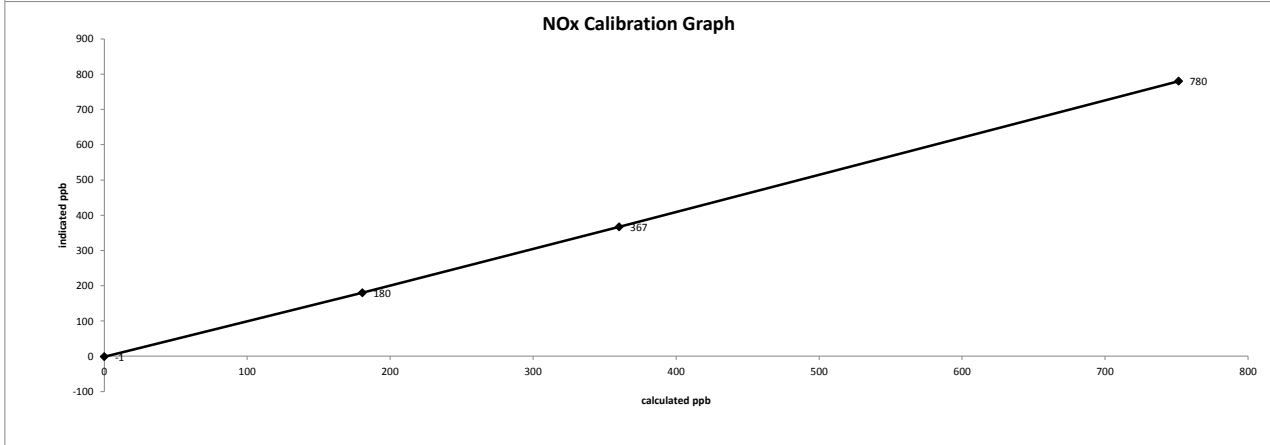
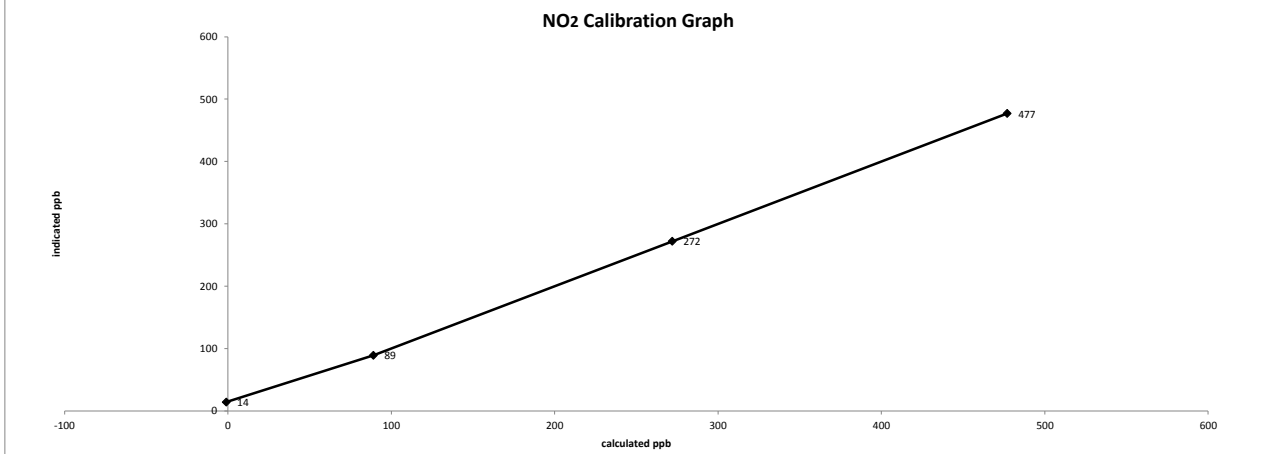
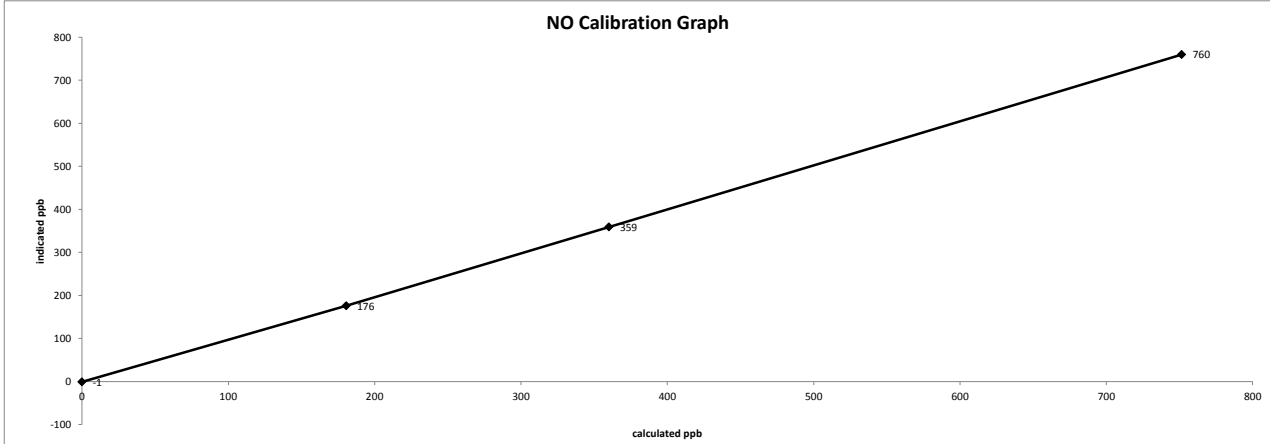
Shutdown calibration was completed prior to installation of repaired LICA analyzer, which came back from factory repair. No NO_x/NO High Point adjustments were made. The NO_x/NO/NO₂ channels will be flagged "M" overnight.

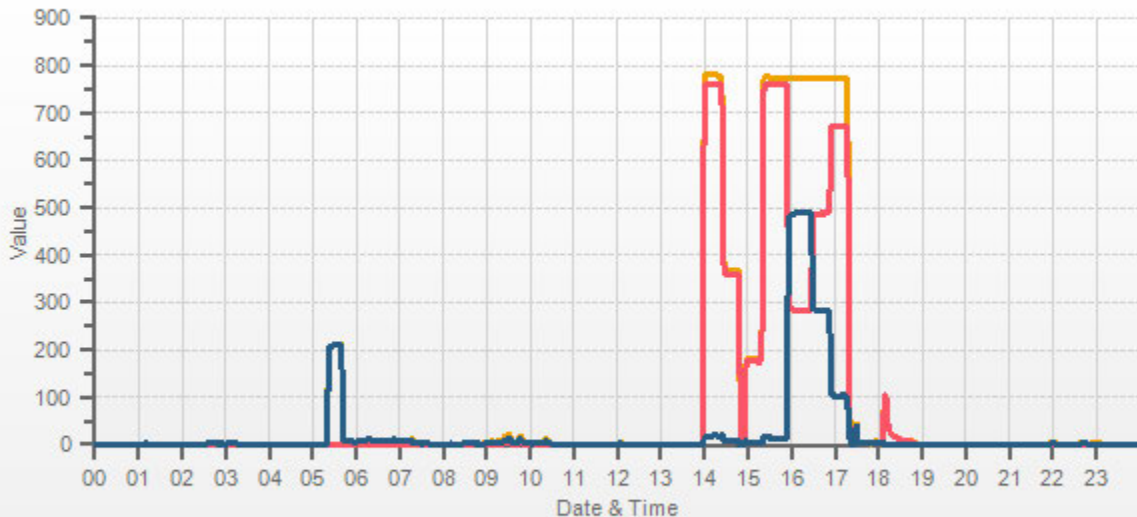
Flow measurements after mid -point
Calibration gas concentration (50.7 ppb) derived from original

Date: October 18, 2017
Company/Airshed: LICA
Location/Station Name: Maskwa

Start/End Time 24 hr. (mst): 13:21 / 17:25
Calibration Purpose: shut down
Calibration Method: Gas Dilution & Gas Phase Titration

Thermo 42C NO-NO2-NOx Analyzer Calibration





— NOX[ppb] — NO[ppb] — NO2[ppb]



API 200E NO-NO2-NOx Analyzer Calibration

Date: October 19, 2017 Company/Airshed: LICA Location/Station Name: Maskwa Start/End Time 24 hr. (mst): 11:02 / 17:20 G.P.T. to be used for Ozone? No Calibration Method: Gas Dilution & Gas Phase Titration	Barometer/B.P./units: F.S. 05544 expires December 5, 2018 922 millibars Thermometer/Station Temp: F.S. 170286131 expires April 19, 2019 22 °C Weather Conditions: Mainly sunny Calibration Purpose: installation Performed By/Reviewer: Alex Yakupov Tom Bourque Cal Gas Expiry Date: July 18, 2019
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Analyzer: ID# or Serial Number: 592 Last Calibration Date: n/a Range ppb: 1000	Correction Factors: <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th></th> <th>Previous C.F.:</th> <th>As Found C.F.:</th> <th>New C.F.:</th> </tr> <tr> <td>NO =</td> <td>n/a</td> <td>n/a</td> <td>0.998</td> </tr> <tr> <td>NO₂ =</td> <td>n/a</td> <td>n/a</td> <td>1.017</td> </tr> <tr> <td>NOx =</td> <td>n/a</td> <td>n/a</td> <td>0.998</td> </tr> </table>		Previous C.F.:	As Found C.F.:	New C.F.:	NO =	n/a	n/a	0.998	NO ₂ =	n/a	n/a	1.017	NOx =	n/a	n/a	0.998
	Previous C.F.:	As Found C.F.:	New C.F.:														
NO =	n/a	n/a	0.998														
NO ₂ =	n/a	n/a	1.017														
NOx =	n/a	n/a	0.998														

Calibration Standards: Low Flow Meter ID/Expiry Date: Defender Low 152020 expires November 21, 2017 High Flow Meter ID/Expiry Date: Defender High 148943 expires November 21, 2017 Calibrator ID/Expiry Date: API id# 627 expires January 27, 2018 Cal Gas Cylinder I.D. #: LL 104222 Cal Gas Conc. (ppm): 50.7 50.7	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th colspan="4" style="text-align: center;">Standard Calibration Points for a Range of: 1000 ppb</th> </tr> <tr> <th>Point</th> <th>Target NO (ppb)</th> <th>Target NO₂ (ppb)</th> <th>Cc Ozone ?</th> </tr> <tr> <td>High</td> <td>780</td> <td>500</td> <td>n/a</td> </tr> <tr> <td>Mid</td> <td>380</td> <td>275</td> <td>n/a</td> </tr> <tr> <td>Low</td> <td>190</td> <td>100</td> <td>n/a</td> </tr> <tr> <td>Extra Point #1</td> <td>n/a</td> <td>n/a</td> <td>n/a</td> </tr> <tr> <td>Extra Point #2</td> <td>n/a</td> <td>n/a</td> <td>n/a</td> </tr> </table>	Standard Calibration Points for a Range of: 1000 ppb				Point	Target NO (ppb)	Target NO ₂ (ppb)	Cc Ozone ?	High	780	500	n/a	Mid	380	275	n/a	Low	190	100	n/a	Extra Point #1	n/a	n/a	n/a	Extra Point #2	n/a	n/a	n/a
Standard Calibration Points for a Range of: 1000 ppb																													
Point	Target NO (ppb)	Target NO ₂ (ppb)	Cc Ozone ?																										
High	780	500	n/a																										
Mid	380	275	n/a																										
Low	190	100	n/a																										
Extra Point #1	n/a	n/a	n/a																										
Extra Point #2	n/a	n/a	n/a																										

ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Calibrator Flow Rates (cc/min)				Calculated NO	Calculated NOx	Indicated NO	Indicated NOx	NO C.F.	NOx C.F.
Point	Diluent	Cal Gas	Total Flow	(ppb)	(ppb)	(ppb)	(ppb)		
adjusted zero	5151	0.0	5151	0	0	0.0	0.0	n/a	n/a
adjusted high	5205	78.7	5284	754.8	754.8	756.0	756.0	0.998	0.998
mid	5246	38.51	5285	369.4	369.4	370.0	370.0	0.998	0.998
low	5270	18.75	5289	179.7	179.7	179.0	179.0	1.004	1.004
calibrator zero	5151	0.00	5151	0.0	0.0	0.0	0.0	n/a	n/a
Average C.F.=								1.000	1.000

ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Calibrator Flow Rates (cc/min)				Calibrator Setting	Indicated NO	Indicated NOx	Indicated NO ₂	NO drop	NO ₂ gain	NO ₂ C.F.
Point	Diluent	Cal Gas	Total Flow	volts or ppb	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)
NOx reference	5205	78.67	5284	0.0	754.0	753.0	-1.0	0.0	-1.0	
adjusted high NO2	5205	78.67	5284	500.0	269.0	745.0	476.0	485.0	477.0	1.017
gpt mid	5205	78.67	5284	285.0	477.0	745.0	268.0	277.0	269.0	1.030
gpt low	5205	78.67	5284	110.0	647.0	747.0	101.0	107.0	102.0	1.049
Average NO ₂ C.F.=										1.032

Linear Regression/Calibration Results:

	NO	NOx	NO ₂	LIMITS
Correlation Coefficient =	1.000	1.000	1.000	> or = 0.995
Slope =	0.998	0.998	1.014	0.95-1.05
b (Intercept as % of full scale) =	-0.04%	-0.04%	-0.25%	± 3% F.S.
% change in C.F. from last cal =	n/a	n/a	n/a	n/a
NO2 converter efficiency			1.00	0.96 to 1.04

As found: NOx SLOPE: n/a NOx OFFS: n/a NO SLOPE: n/a NO OFFS: n/a SAMP FLW: n/a OZONE FL: n/a PMT: n/a NORM PMT: n/a AZERO: n/a HVPS: n/a RCELL TEMP: n/a BOX TEMP: n/a PMT TEMP: n/a IZS TEMP: n/a MOLY TEMP: n/a RCEL: n/a SAMP: n/a Expected Value NO: n/a Expected Value NO2: n/a Expected Value NOx: n/a	As left: NOx SLOPE: 0.856 NOx OFFS: 2.6 NO SLOPE: 0.857 NO OFFS: 0.9 SAMP FLW: 411 OZONE FL: 71 PMT: 33.2 NORM PMT: 4.4 AZERO: 31.5 HVPS: 667 RCELL TEMP: 50.0 BOX TEMP: 30.0 PMT TEMP: 7.2 IZS TEMP: 45.0 MOLY TEMP: 313.4 RCEL: 4.7 SAMP: 26.7 Expected Value NO: 10 Expected Value NO2: 450 Expected Value NOx: 460
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Comments:
 The analyzer sample inlet filter was changed.
 The manifold blower was found to be working normally.
 No high point NO2 adjustment was required/made.

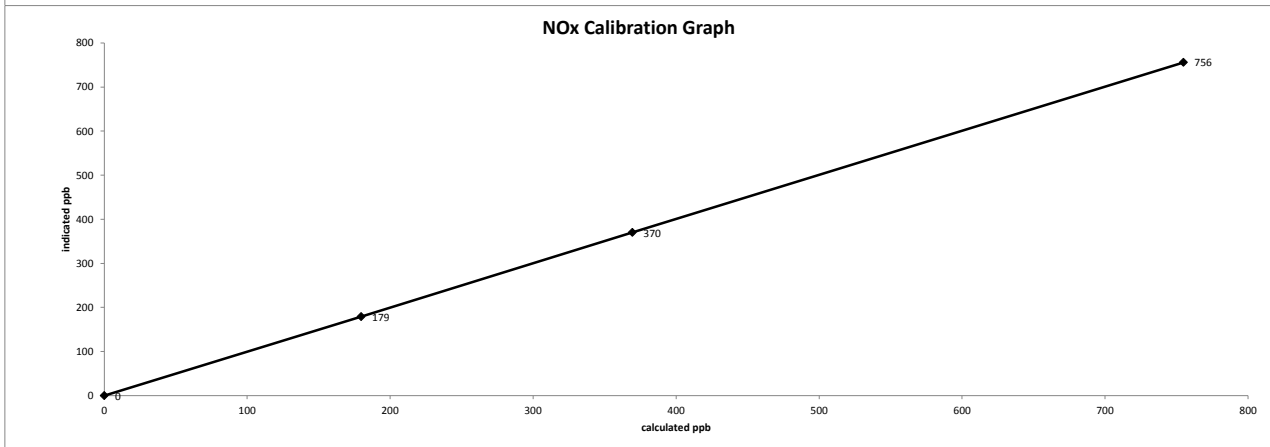
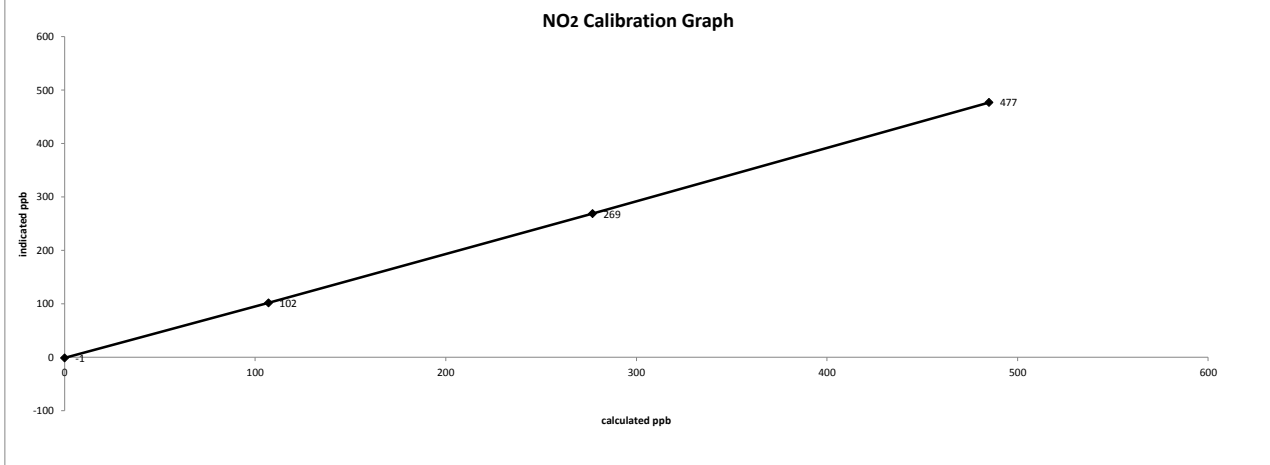
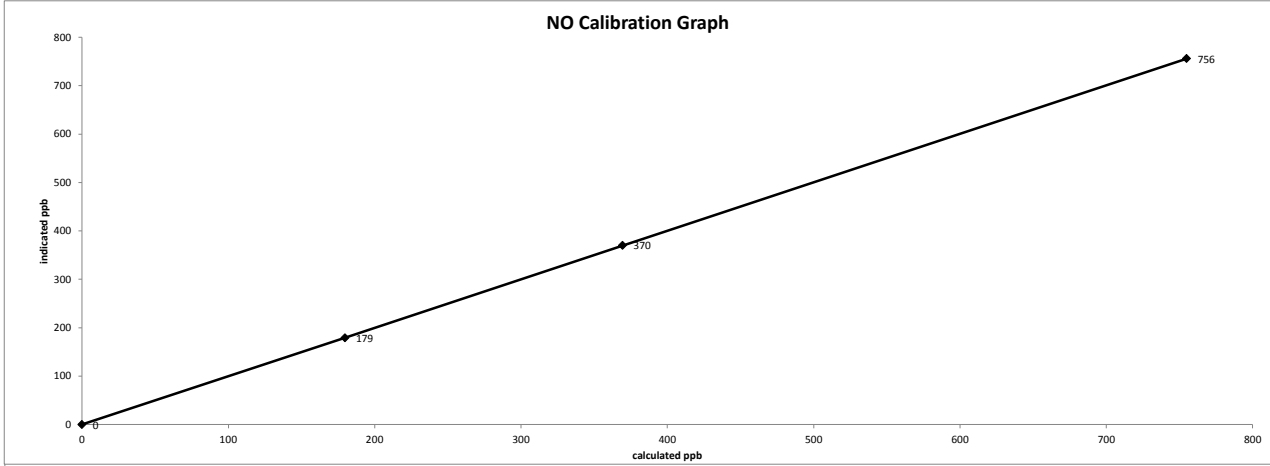
After installation/connection (Oct 18, 2017) all NOx channel were left flagged "M" overnight for the analyzer to gain stability. The analyzer came back from repair by the Manufacturer.

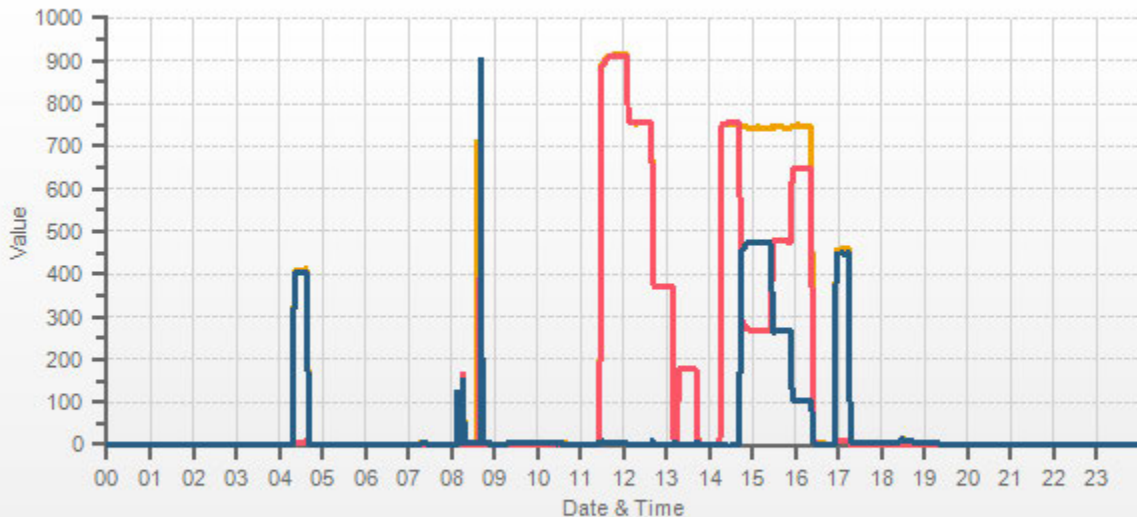
Flow measurements after mid -point
 Calibration gas concentration (50.7 ppb) derived from original

Date: October 19, 2017
Company/Airshed: LICA
Location/Station Name: Maskwa

Start/End Time 24 hr. (mst): 11:02 / 17:20
Calibration Purpose: installation
Calibration Method: Gas Dilution & Gas Phase Titration

API 200E NO-NO2-NOx Analyzer Calibration





— NOX[ppb] — NO[ppb] — NO2[ppb]



API 200E NO-NO2-NOx Analyzer Calibration

Date: October 20, 2017	Barometer/B.P./units: F.S. 05544 expires December 5, 2018	918	millibars
Company/Airshed: LICA	Thermometer/Station Temp: F.S. 170286131 expires April 19, 2019	22	°C
Location/Station Name: Maskwa	Weather Conditions: A few clouds		
Start/End Time 24 hr. (mst): 10:11 / 14:52	Calibration Purpose: repeat		
G.P.T. to be used for Ozone? No	Performed By/Reviewer: Alex Yakupov		Tom Bourque
Calibration Method: Gas Dilution & Gas Phase Titration	Cal Gas Expiry Date: July 18, 2019		

Analyzer:		Correction Factors:		
ID# or Serial Number: 592		Previous C.F.:	As Found C.F.:	New C.F.:
Last Calibration Date: October 19, 2017		NO = 0.998	1.009	#VALUE!
Range ppb: 1000		NO ₂ = 1.017	1.015	1.000
		NOx = 0.998	1.009	#VALUE!

Calibration Standards:		Standard Calibration Points for a Range of: 1000 ppb			
Low Flow Meter ID/Expiry Date: Defender Low 152020 expires November 21, 2017		Point	Target NO (ppb)	Target NO₂ (ppb)	Cc Ozone ?
High Flow Meter ID/Expiry Date: Defender High 148943 expires November 21, 2017		High	780	500	n/a
Calibrator ID/Expiry Date: API id# 627 expires January 27, 2018		Mid	380	275	n/a
Cal Gas Cylinder I.D. #: LL 104222		Low	190	100	n/a
Cal Gas Conc. (ppm): 50.7 50.7		Extra Point #1	n/a	n/a	n/a
		Extra Point #2	n/a	n/a	n/a

ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Calibrator Flow Rates (cc/min)				Calculated NO	Calculated NOx	Indicated NO	Indicated NOx	NO C.F.	NOx C.F.
Point	Diluent	Cal Gas	Total Flow	(ppb)	(ppb)	(ppb)	(ppb)		
as found zero	5174	0.0	5174	0	0	0.0	0.0	n/a	n/a
as found high	5230	78.5	5308	749.7	749.7	743.0	743.0	1.009	1.009
Average C.F. =								n/a	n/a

ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Calibrator Flow Rates (cc/min)				Calibrator Setting	Indicated NO	Indicated NOx	Indicated NO ₂	NO drop	NO ₂ gain	NO ₂ C.F.
Point	Diluent	Cal Gas	Total Flow	volts or ppb	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)
NOx reference	5230	78.49	5308	0.0	743.0	743.0	0.0	0.0	0.0	
as found high NO2	5230	78.49	5308	510.0	256.0	736.0	480.0	487.0	480.0	1.015
adjusted high NO2	5230	78.49	5308	510.0	256.0	743.0	487.0	487.0	487.0	1.000
gpt mid	5230	78.49	5308	285.0	470.0	744.0	274.0	273.0	274.0	0.996
gpt low	5230	78.49	5308	110.0	641.0	743.0	103.0	102.0	103.0	0.990
Average NO₂ C.F. =										0.996

Linear Regression/Calibration Results:

	NO	NOx	NO ₂	LIMITS
Correlation Coefficient =	n/a	n/a	1.000	> or = 0.995
Slope =	n/a	n/a	1.000	0.95-1.05
b (Intercept as % of full scale) =	n/a	n/a	0.05%	± 3% F.S.
% change in C.F. from last cal =	-1.10%	-1.10%	0.24%	± 10%
NO2 converter efficiency			0.97	0.96 to 1.04

As found:		As left:	
NOx SLOPE:	0.856	NOx SLOPE:	0.856
NOx OFFS:	2.6	NOx OFFS:	2.6
NO SLOPE:	0.857	NO SLOPE:	0.857
NO OFFS:	0.9	NO OFFS:	0.9
SAMP FLW:	409	SAMP FLW:	409
OZONE FL:	71	OZONE FL:	71
PMT:	24.1	PMT:	34.8
NORM PMT:	0.9	NORM PMT:	4.5
AZERO:	27.9	AZERO:	27.8
HVPS:	667	HVPS:	667
RCELL TEMP:	50.0	RCELL TEMP:	50.0
BOX TEMP:	28.8	BOX TEMP:	30.5
PMT TEMP:	7.2	PMT TEMP:	7.3
IZS TEMP:	45.0	IZS TEMP:	45.0
MOLY TEMP:	315.1	MOLY TEMP:	313.5
RCEL:	4.7	RCEL:	4.7
SAMP:	26.5	SAMP:	26.5
Expected Value NO:	10	Expected Value NO:	10
Expected Value NO2:	450	Expected Value NO2:	450
Expected Value NOx:	460	Expected Value NOx:	460

Comments:

The manifold blower was found to be working normally.

The result of the installation calibration performed on October 18 indicated the (GPT) low point was 4.9% different from the expected value. This repeat calibration was performed as an extra quality assurance measure to verify the analyzer was operating within AMD requirements.

Flow measurements after mid -point

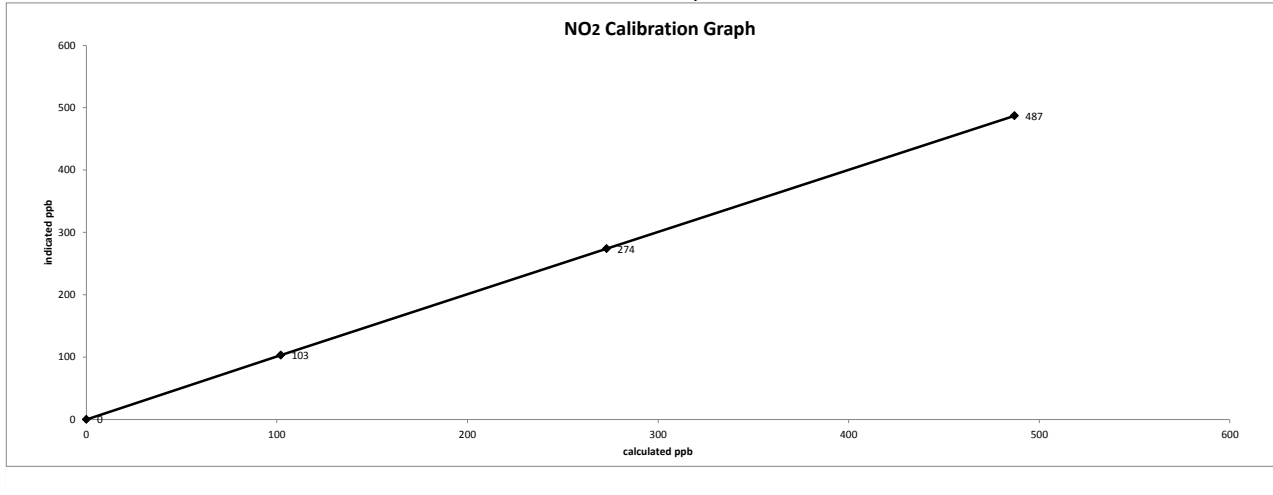
Calibration gas concentration (50.7 ppb) derived from original

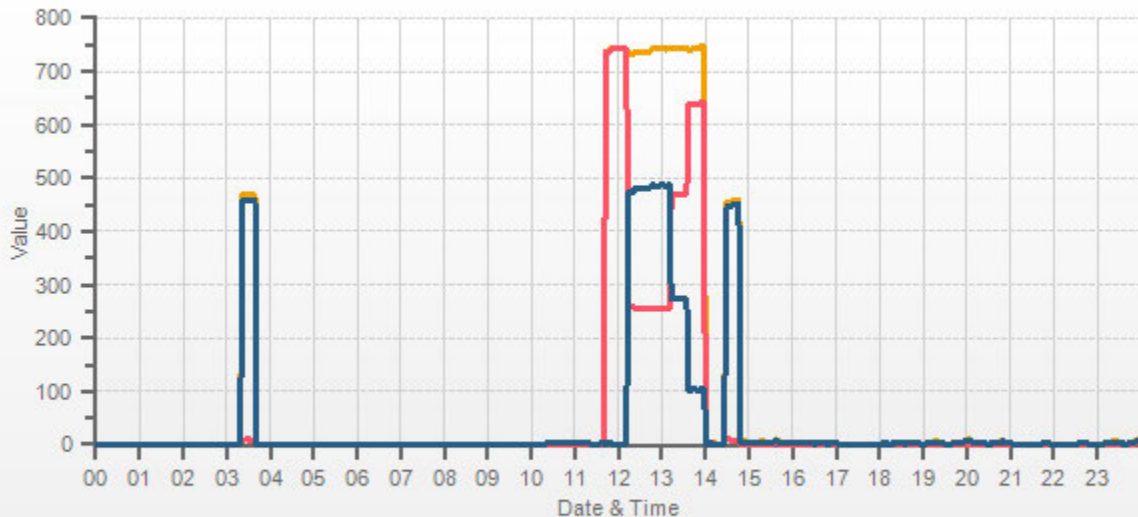
Date: October 20, 2017
Company/Airshed: LICA
Location/Station Name: Maskwa

Start/End Time 24 hr. (mst): 10:11 / 14:52
Calibration Purpose: repeat
Calibration Method: Gas Dilution & Gas Phase Titration

API 200E NO-NO2-NOx Analyzer Calibration

NO2 Calibration Graph





— NOX[ppb] — NO[ppb] — NO2[ppb]



API 200E NO-NO2-NOx Analyzer Calibration

Date: October 26, 2017	Barometer/B.P./units: F.S. 05544 expires December 5, 2018	950	millibars
Company/Airshed: LICA	Thermometer/Station Temp: F.S. 170286131 expires April 19, 2019	22	°C
Location/Station Name: Maskwa	Weather Conditions: Light snow		
Start/End Time 24 hr. (mst): 13:39 / 20:15	Calibration Purpose: repeat		
G.P.T. to be used for Ozone? No	Performed By/Reviewer: Alex Yakupov		Tom Bourque
Calibration Method: Gas Dilution & Gas Phase Titration	Cal Gas Expiry Date: July 18, 2019		

Analyzer:	Correction Factors:
ID# or Serial Number: 592	Previous C.F.: 0.998 As Found C.F.: 1.017 New C.F.: 1.000
Last Calibration Date: October 20, 2017	NO₂: 0.996 0.998 1.002
Range ppb: 1000	NOx: 0.998 1.018 1.000

Calibration Standards:

Low Flow Meter ID/Expiry Date: Defender Low 152020 expires November 21, 2017 High Flow Meter ID/Expiry Date: Defender High 148943 expires November 21, 2017 Calibrator ID/Expiry Date: API Id# 627 expires January 27, 2018 Cal Gas Cylinder I.D. #: LL 104222 Cal Gas Conc. (ppm): 50.7 50.7	Standard Calibration Points for a Range of: 1000 ppb <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Point</th> <th>Target NO (ppb)</th> <th>Target NO₂ (ppb)</th> <th>Cc Ozone ?</th> </tr> </thead> <tbody> <tr><td>High</td><td>780</td><td>500</td><td>n/a</td></tr> <tr><td>Mid</td><td>380</td><td>275</td><td>n/a</td></tr> <tr><td>Low</td><td>190</td><td>100</td><td>n/a</td></tr> <tr><td>Extra Point #1</td><td>n/a</td><td>n/a</td><td>n/a</td></tr> <tr><td>Extra Point #2</td><td>n/a</td><td>n/a</td><td>n/a</td></tr> </tbody> </table>	Point	Target NO (ppb)	Target NO ₂ (ppb)	Cc Ozone ?	High	780	500	n/a	Mid	380	275	n/a	Low	190	100	n/a	Extra Point #1	n/a	n/a	n/a	Extra Point #2	n/a	n/a	n/a
Point	Target NO (ppb)	Target NO ₂ (ppb)	Cc Ozone ?																						
High	780	500	n/a																						
Mid	380	275	n/a																						
Low	190	100	n/a																						
Extra Point #1	n/a	n/a	n/a																						
Extra Point #2	n/a	n/a	n/a																						

ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Calibrator Flow Rates (cc/min)				Calculated NO	Calculated NOx	Indicated NO	Indicated NOx	NO C.F.	NOx C.F.
Point	Diluent	Cal Gas	Total Flow	(ppb)	(ppb)	(ppb)	(ppb)		
as found zero	5159	0.0	5159	0	0	-1.0	0.0	n/a	n/a
as found high	5210	78.4	5288	751.3	751.3	738.0	738.0	1.017	1.018
adjusted zero	5159	0.00	5159	0.0	0.0	0.0	0.0	n/a	n/a
adjusted high	5210	78.36	5288	751.3	751.3	751.0	751.0	1.000	1.000
mid	5264	38.36	5302	366.8	366.8	368.0	368.0	0.997	0.997
low	5273	18.64	5292	178.6	178.6	177.0	177.0	1.009	1.009
calibrator zero	5159	0.00	5159	0	0	0.0	0.0	n/a	n/a
Average C.F. =								1.002	1.002

ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Calibrator Flow Rates (cc/min)				Calibrator Setting	Indicated NO	Indicated NOx	Indicated NO ₂	NO drop	NO ₂ gain	NO ₂ C.F.
Point	Diluent	Cal Gas	Total Flow	volts or ppb	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)
NOx reference	5210	78.36	5288	0.0	752.0	753.0	0.0	0.0	0.0	
as found high NO2	5210	78.36	5288	510.0	256.0	754.0	497.0	496.0	497.0	0.998
adjusted high NO2	5210	78.36	5288	510.0	257.0	752.0	494.0	495.0	494.0	1.002
gpt mid	5210	78.36	5288	285.0	475.0	753.0	277.0	277.0	277.0	1.000
gpt low	5210	78.36	5288	110.0	647.0	753.0	105.0	105.0	105.0	1.000
Average NO₂ C.F. =										1.001

Linear Regression/Calibration Results:

	NO	NOx	NO ₂	LIMITS
Correlation Coefficient =	1.000	1.000	1.000	> or = 0.995
Slope =	0.999	0.999	1.002	0.95-1.05
b (Intercept as % of full scale) =	-0.03%	-0.03%	0.02%	± 3% F.S.
% change in C.F. from last cal =	-1.87%	-2.01%	-0.20%	± 10%
NO ₂ converter efficiency			0.97	0.96 to 1.04

	As found:		As left:
NOx SLOPE:	0.856	NOx SLOPE:	0.870
NOx OFFS:	2.6	NOx OFFS:	1.3
NO SLOPE:	0.857	NO SLOPE:	0.869
NO OFFS:	0.9	NO OFFS:	0.2
SAMP FLW:	423	SAMP FLW:	422
OZONE FL:	73	OZONE FL:	73
PMT:	25.8	PMT:	26.1
NORM PMT:	5.6	NORM PMT:	3.9
AZERO:	24.2	AZERO:	26.3
HVPS:	667	HVPS:	667
RCCELL TEMP:	50.0	RCCELL TEMP:	50.0
BOX TEMP:	30.5	BOX TEMP:	32.3
PMT TEMP:	7.3	PMT TEMP:	7.5
IZS TEMP:	45.0	IZS TEMP:	45.0
MOLY TEMP:	315.2	MOLY TEMP:	315.3
RCEL:	4.8	RCEL:	4.8
SAMP:	27.5	SAMP:	27.4
Expected Value NO:	10	Expected Value NO:	7
Expected Value NO ₂ :	450	Expected Value NO ₂ :	412
Expected Value NOx:	460	Expected Value NOx:	420

Comments:

The manifold blower was found to be working normally.

Repeat calibration required to correct the EV (it was installed 5 days ago and SPAN readings drifted upon stabilizing during first 5 days)

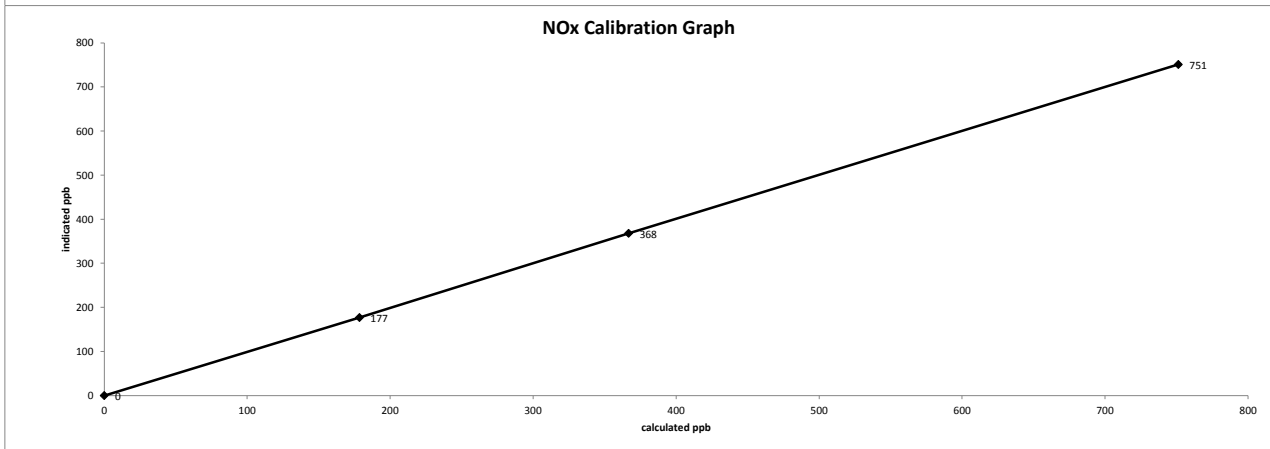
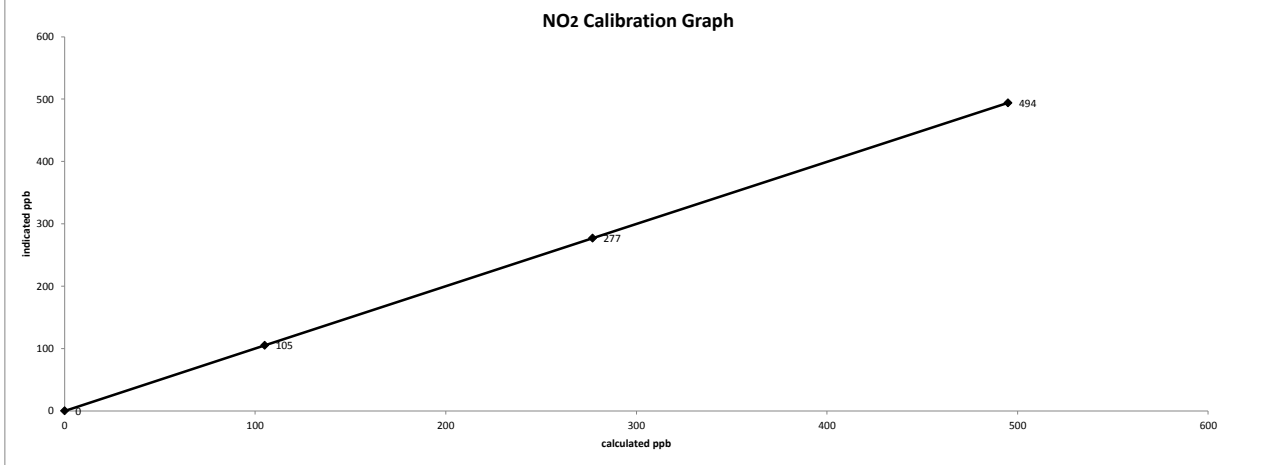
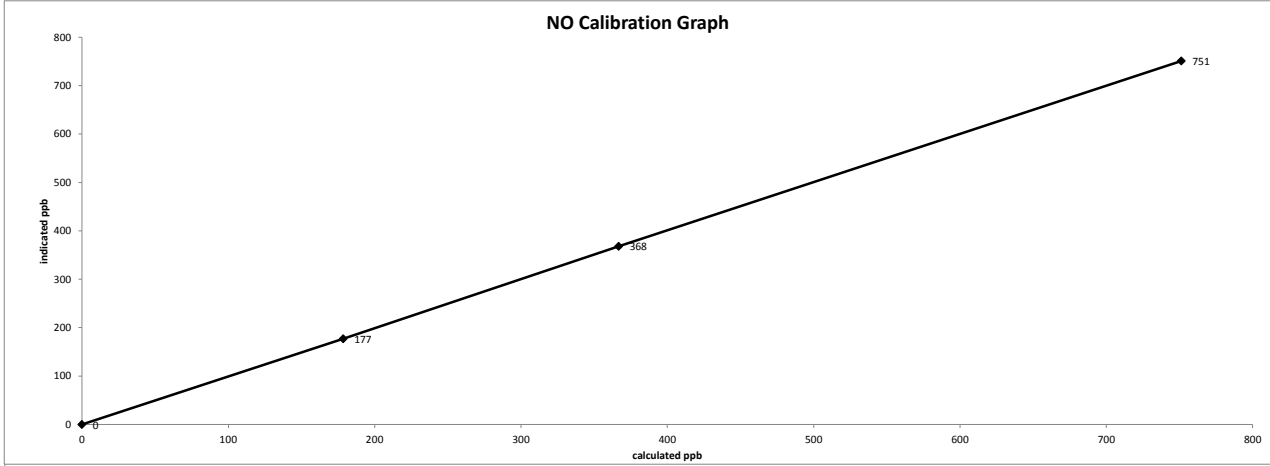
Flow measurements after mid -point

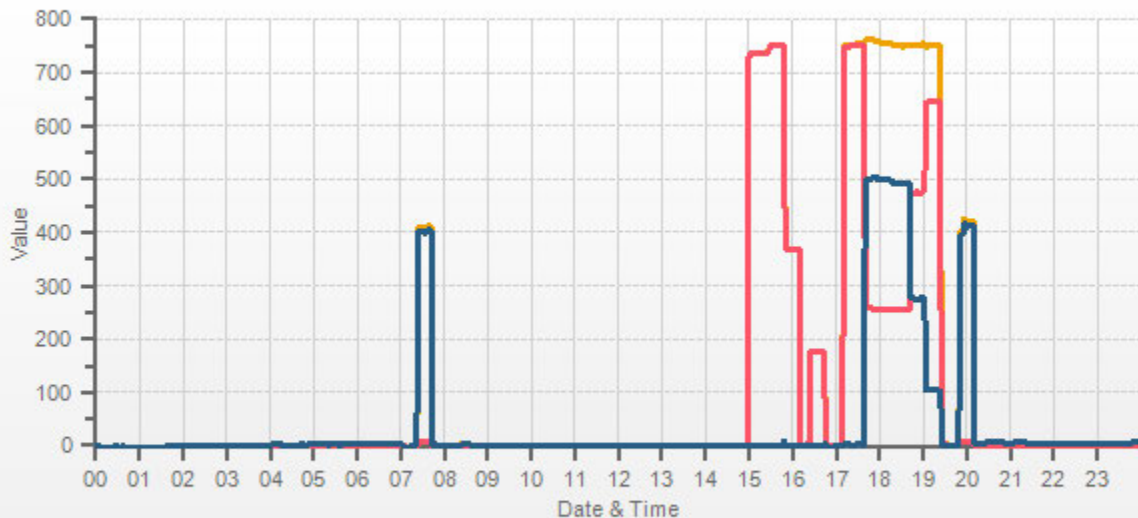
Calibration gas concentration (50.7 ppb) derived from original

Date: October 26, 2017
Company/Airshed: LICA
Location/Station Name: Maskwa

Start/End Time 24 hr. (mst): 13:39 / 20:15
Calibration Purpose: repeat
Calibration Method: Gas Dilution & Gas Phase Titration

API 200E NO-NO2-NOx Analyzer Calibration





— NOX[ppb] — NO[ppb] — NO2[ppb]

WIND SYSTEM

Sonic Wind Sensor Certificate of Calibration

Sensor Model No.:	50.5H	Sensor Serial No.:	H10703
Sensor Output Swing	0V - 1.0V	Sensor Output Range:	0 - 50.0 MPS
Customer:	Maxxam Analytics	Sales Order No.:	115035
Tested per PO:	35-62828	Calibration Date:	03/30/2016
Calibrated by:	David Frith <i>DF</i>	QC Inspection	<i>Byron Dawson</i>

Instrument Condition Within Tolerance:	As Found	<input type="checkbox"/>	As Left	<input checked="" type="checkbox"/>
Corrective Action:	No Adjustment	<input type="checkbox"/>	Adjust	<input checked="" type="checkbox"/>
	Preventative Maintenance	<input type="checkbox"/>	Repair	<input type="checkbox"/>

As Found Test Date: N/A As Left Test Date: 03/30/2016

Quality Control Manual Revision: September 16, 2013 MP42201 Rev. G.

All Work Performed per Customer Purchase Order Requirements.

Calibration Document No. 50.5-6100

Test Equipment Used for Calibration of Instruments

Description	Manufacturer	Model No.	Serial No.	Cal Date	Cal Due	Voltage Accuracy	Time Base Accuracy
Data Acquisition	Campbell Scientific	CR1000	6569	4/06/2015	4/06/2018	+/- 3mV	< 6 ppm
NIST Cupset	Met One Instruments	170-41	3309	4/24/2012	4/24/2017	Accuracy < 0.15 mph or 1% WS	

Environmental Data: Temperature 65 to 80 Deg F Vibration none

Humidity 20 to 70% Radiation none

The standards used for calibration have accuracies equal to or greater than the instruments tested. These standards are on record and are traceable to NIST to the extent allowed by the institute's calibration facility. Unless otherwise stated heron, all instruments are calibrated to meet the manufacturer's published specifications. The calibration system complies with MIL-STD-45662A (8/1/88). Instrument's accuracy meets the requirements of Regulatory Guide 1.23 (2/72). Compliant with IS) 9001:2008 requirements

METEOROLOGICAL SYSTEM CHECK

Meteorological System Checklist

Performed by: Alex Yakupov
 Station: **Maskwa**
 Start: 12:16 End: 12:34

PRECIPITATION SENSOR CHECK

	YES	NO
Is the sensor Level?	YES	
Is the heater operating properly?	YES	
Are the bucket drain holes clean?	YES	
Is the inner screen on the housing? (screen should be on between July and September)		NO
Is the upper screen on the housing? (screen should be on between July and September)		NO
Is the housing clean?	YES	
Is the area around the housing clean and free from obstacles?	YES	
Is the tipping sensor working properly?	YES	
Test with water (12:20 - 2.0 mm)	PASS	

Comments: the rain gauge has been tested with water. Responce is timely and accurate.
 No issues.

Field Technician: Alex Yakupov October 03, 2017

CALIBRATORS

Company Maxxam/SIA Operator: Chris

Calibrator:				Flow Measurement Device:			
Make/Model	<u>API 700</u>			Make/Model	<u>Definer 530</u>		
Serial Number	<u>627</u>			Serial Number	<u>H-148944, L-152019</u>		
Last Verification Date	<u>February 3, 2016</u>			Temperature (°C)	<u>23.5</u>		
NO Cylinder S/N	<u>EY0000597</u>			Barometric Pressure	<u>707.1 mmHg</u>		
NO [PPM]	<u>49.0</u>	NOx [PPM]	<u>49.0</u>				
Expiry Date	<u>December 8, 2019</u>						

Dilution Flow (sccm)					
Pt. #1	<u>4892</u>	Pt. #2	<u>4975</u>	Pt. #3	<u>4951</u>
Gas Flow (sccm)					
Pt. #1	<u>79.7</u>	Pt. #2	<u>38.8</u>	Pt. #3	<u>19.4</u>

Calibrator Flow (sccm)		Calculated Conc.(ppm)		Indicated Conc.(ppm)			% Difference vs Audit Gas	
Dilution	Gas	NO	NOx	NO	NO ₂	NOx	NO	NOx
	0.0	0.0000	0.0000	0.0000	-0.0004	-0.0004	Limit ± 10%	
4972	79.7	0.7855	0.7855	0.7883	0.0004	0.7887	0.4%	0.5%
4936	38.8	0.3822	0.3822	0.3816	0.0005	0.3822	-0.2%	0.1%
4970	19.4	0.1913	0.1913	0.1902	0.0006	0.1913	-0.6%	0.2%
Absolute Average Percent Difference							0.1%	0.3%

LINEAR REGRESSION ANALYSIS *y=mx+b (where x=calculated concentration, y=indicated concentration)*

NO	LIMITS	NOx
Correlation= 1.0000	≥ 0.990	Correlation= 1.0000
m (Slope)= 1.0041	0.90-1.10	m (Slope)= 1.0046
b (Intercept % of FS)= -0.1118	± 3% F.S.	b (Intercept % of FS)= -0.0871

Flow	O ₃ Conc	NO Decrease	NO	NO ₂	NOX	% Diff. Vs Audit gas	
4972	0	0.0000	0.7867	0.0014	0.7881	NO ₂	% Diff, Limit
4972	500	0.5127	0.2740	0.5104	0.7849	-0.7%	± 10%
4972	275	0.2863	0.5004	0.2860	0.7865	-0.6%	± 10%
4972	90	0.0940	0.6927	0.0954	0.7880	0.0%	± 10%
Absolute Average Percent Difference						0%	± 10%

LINEAR REGRESSION ANALYSIS *y=mx+b (where x=calculated concentration, y=indicated concentration)*

NO₂	LIMITS
Correlation= 1.0000	≥ 0.995
m (Slope)= 0.9924	0.90-1.10
b (Intercept % of FS)= 0.1755	± 3% F.S.

AENV Standards		NO_x Analyzer	
Audit Calibrator		Make/Model	<u>Thermo 42i</u>
Make/Model	<u>Thermo 146i</u>	Serial/AMU Number	<u>AMU 1868</u>
Serial/AMU Number	<u>AMU1809</u>	Last Calibration Date	<u>January 25, 2017</u>
SRM Gas Cylinder No.	<u>CAL018140</u>	Full Scale (ppm)	<u>1.0</u>
Cylinder Conc. (ppm)	<u>48.79</u>	Cylinder Gas Expiry Date	<u>March 25, 2019</u>

COMMENTS:

Auditor: Shea Beaton
Operator Signature: 

Date: January 27, 2017
Location: McIntyre Center Edmonton

Company <u>Maxxam</u>		Operator: <u>Mike</u>	
Calibrator:		Flow Measurement Device:	
Make/Model	<u>Sabio 2010D</u>	Make/Model	<u>Bios Defender 530</u>
Serial Number	<u>11900613</u>	Serial Number	<u>HI148944 Lo 152019</u>
Last Verification Date	<u>March 31, 2016</u>	Temperature (°C)	<u>23.9</u>
NO Cylinder S/N	<u>EY0000769</u>	Barometric Pressure	<u>698mmHg</u>
NO [PPM]	<u>51.1 NOx [PPM]</u>		<u>51.2</u>
Expiry Date	<u>December 8, 2019</u>		

Dilution Flow (sccm)		
Pt. #1 <u>4879</u>	Pt. #2 <u>4932</u>	Pt. #3 <u>4950</u>
Gas Flow (sccm)		
Pt. #1 <u>74.5</u>	Pt. #2 <u>36.4</u>	Pt. #3 <u>18.2</u>

Calibrator Flow (sccm)		Calculated Conc.(ppm)		Indicated Conc.(ppm)			% Difference vs Audit Gas	
Dilution	Gas	NO	NOx	NO	NO ₂	NOx	NO	NOx
4965	0.0	0.0000	0.0000	0.0001	0.0000	0.0001	Limit ± 10%	
4954	74.5	0.7685	0.7700	0.7915	0.0008	0.7923	3%	3%
4968	36.4	0.3744	0.3751	0.3832	0.0006	0.3838	2%	2%
4968	18.2	0.1872	0.1876	0.1916	0.0002	0.1918	2%	2%
Absolute Average Percent Difference							3%	2%

LINEAR REGRESSION ANALYSIS *y=mx+b (where x=calculated concentration, y=indicated concentration)*

NO		LIMITS		NOx	
Correlation=	1.0000	≥ 0.990		Correlation=	1.0000
m (Slope)=	1.0301	0.90-1.10		m (Slope)=	1.0291
b (Intercept % of FS)=	-0.0919	± 3% F.S.		b (Intercept % of FS)=	-0.0881

Flow	O ₂ Conc	NO Decrease	NO	NO ₂	NOX	% Diff. Vs Audit gas	
4954	0.000	0.0000	0.7949	0.0005	0.7954	NO ₂	% Diff. Limit
4954	0.510	0.5104	0.2845	0.5072	0.7917	-1%	± 10%
4954	0.250	0.2516	0.5433	0.2514	0.7944	0%	± 10%
4954	0.100	0.1085	0.6864	0.1087	0.7951	0%	± 10%
Absolute Average Percent Difference						0%	± 10%

LINEAR REGRESSION ANALYSIS *y=mx+b (where x=calculated concentration, y=indicated concentration)*

NO₂		LIMITS
Correlation=	1.0000	≥ 0.995
m (Slope)=	0.9926	0.90-1.10
b (Intercept % of FS)=	0.0925	± 3% F.S.

AENV Standards	NO_x Analyzer
Audit Calibrator	
Make/Model	<u>Thermo 146i</u>
Serial/AMU Number	<u>1809</u>
SRM Gas Cylinder No.	<u>CAL018140</u>
Cylinder Conc. (ppm)	<u>48.79</u>
	Make/Model
	<u>Thermo 42i</u>
	Serial/AMU Number
	<u>1868</u>
	Last Calibration Date
	<u>March 15, 2017</u>
	Full Scale (ppm)
	<u>1.0</u>
	Cylinder Gas Expiry Date
	<u>March 28, 2019</u>

COMMENTS: Gas has ~50ppm SO2

Auditor: Shea Beaton
Operator Signature: [Signature]

Date: March 16, 2017
Location: McIntyre Center Edmonton

CALIBRATION GASES



Calibration Gas Audit

Single Component Cylinder Gas

File No. 2016-335CGA

Company: Maxxam **Operator's Name:** Russell Kirchner
Cylinder #: LL104222 **Concentration PPM:** 50.6 **Tolerance(%)** 1 **Certified By:** Praxair
Expiry Date: July 2019

Reference Calibrator and Gas:	Flow Measurement Device:
Make/Model: <u>R&R MFC 201</u>	Make/Model: <u>Bios DC2</u>
Serial Number: <u>AMU 1690</u>	Serial Number: <u>AMY 1659</u>
Last Verification Date: <u>October 19, 2016</u>	Temp. °C: <u>24.5 C</u>
Gas Type: <u>SO2</u> Conc. <u>98.07</u>	B.P. <u>706 mmhg</u>
Cylinder Number: <u>CA:016625</u>	
Expiry Date: <u>January 2019</u>	

Reference Analyzer:
Make/Model: Teco 43C **Serial/AMU Number:** 1623
Instrument Settings: **Zero:** 9.2 **Span:** 1.024 **Range:** 1.0
Last Calibration: **Date:** Oct 19/16 **C.F.** 1.000 **Done By:** Al Clark

Calibrator Flows (sccm)		Indicated Concentration (PPM)	Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration
Dilution	Gas				
5000	0.0	0.000	0.0000	0.0000	0.000
4935	82.0	0.830	0.01662	60.183	50.0
4968	40.8	0.412	0.00821	121.765	50.2
4955	20.2	0.203	0.00408	245.297	49.8
Average Cylinder Concentration:					50.0

Previous Stated Concentration PPM: 50.6

Percent variance from Stated: 1

Meets Manufacturer Tolerance. Use manufacturers stated concentration **COMMENTS:** _____
 < =5% Outside Manufacturer Tolerance. Use manufacturers concentration _____
 > 5% Outside Manufacturer Tolerance. **DO NOT USE** this cylinder _____

Auditor: Al Clark
Operator Signature: *Al Clark*

Date: October 19, 2016
Location: McIntyre Center Edmonton



Calibration Gas Audit

Single Component Cylinder Gas

File No. 2016-334CGA

Company: Maxxam **Operator's Name:** Russell Kirchner

Cylinder #: EY0000654 Concentration PPM: 10.2 Tolerance(%): 2 Certified By: Praxair

Expiry Date: June 2019

Reference Calibrator and Gas:	Flow Measurement Device:
Make/Model: <u>R&R MFC 201</u>	Make/Model: <u>Bios DC2</u>
Serial Number: <u>AMU 1690</u>	Serial Number: <u>AMU 1659</u>
Last Verification Date: <u>October 19, 2016</u>	Temp. °C: <u>24.0 C</u>
Gas Type: <u>H2S</u> Conc. <u>20.43</u>	B.P. <u>706 mmhg</u>
Cylinder Number: <u>CAL015584</u>	
Expiry Date: <u>January 2019</u>	

Reference Analyzer:

Make/Model: Teco 450i Serial/AMU Number: 1980

Instrument Settings: Zero: 16.6 Span: 1.231 Range: 0.1

Last Calibration: Date: Oct 19/16 C.F. 1.000 Done By: Al Clark

Calibrator Flows (scm)		Indicated Concentration (PPM)	Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration
Dilution	Gas				
5000	0.0	0.0000	0.00752	132.895	10.2
5050	38.0	0.0764	0.00752	132.895	10.2
5050	17.8	0.0355	0.00352	283.708	10.1
5023	9.1	0.0182	0.00181	551.978	10.0
Average Cylinder Concentration:					10.1

Previous Stated Concentration PPM: 10.2

Percent variance from Stated: 1

Meets Manufacturer Tolerance. Use manufacturers stated concentration **COMMENTS:** _____

<=5% Outside Manufacturer Tolerance. Use manufacturers concentration _____

> 5% Outside Manufacturer Tolerance. **DO NOT USE** this cylinder _____

Auditor: Al Clark Date: October 19, 2016

Operator Signature: *Al Clark* Location: McIntyre Center Edmonton



Calibration Gas Audit

CH4 / C3H8 Cylinder Gas

File No. 2015-092CGA

Company: Maxxam Operators name: Chris Wesson
 Cylinder #: LL165372 Conc CH4 (PPM) 606/212 Tolerance (%) 0.5 Certified By: Praxair

Reference Calibrator and Gas:

Make/Model R&R MFC 201
 Serial Number AMU 1698
 Last Verification Date January 18, 2016
 Gas Type CH4 Conc. 999.2
 Cylinder Number D751932
 Gas Type C3H8 Conc. 246.5
 Cylinder Number XF0037998

Flow Measurement Device:

Make/Model Bios DC-2
 Serial Number Blos D
 Temp. °C 24.5
 B.P. 688mmHg

Reference Analyzer:

Make/Model Thermo 55C Serial/AMU Number: 1643
 Instrument Settings Zero: NA Span: NA Range: 20.0
 Last Calibration: Date: 18-Jan-16 C.F. 1.000 Done By: SB

Calibrator Flows (scem)		Indicated Conc. (ppm)		Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration	
Dilution	Gas	CH4	C3H8			CH4	C3H8
2568	0.00	0.00	0.00	0.02140	46.722	607	214
2630	56.29	12.99	12.62	0.02140	46.722	607	214
2588	19.73	4.62	4.50	0.00762	131.171	606	215
2580	9.69	2.29	2.24	0.00376	266.254	610	217
Average Cylinder Concentration:						608	215

<u>CH4</u>	<u>C3H8</u>
Previous Stated Concentration PPM: <u>606</u>	<u>212</u>
Percent variance from Stated: <u>0.3</u>	<u>1.6</u>

Cylinder gas tolerances based on CH4 only

Meets Manufacturer Tolerance. Use manufacturers stated concentration COMMENTS: _____
 <=5% Outside Manufacturer Tolerance. Use manufacturers concentration C3H8 manufacturers tolerance 1.1%
 > 5% Outside Manufacturer Tolerance. **DO NOT USE** this cylinder

Auditor: Shea Beaton Date: January 19, 2016
 Operator Signature: _____ Location: McIntyre Center Edmonton



Calibration Gas Audit

NO Cylinder Gas

File No. 2016-336CGA

Company: Maxxam **Operators name:** Russell Kirchner

Cylinder #: LL104222 Conc (PPM) 50.7/50.9 Tolerance (%) 1 Certified By: Praxair

Expiry Date: July 2019

Reference Calibrator and Gas:				Flow Measurement Device:	
Make/Model	<u>Teco 146i</u>			Make/Model	<u>Bios DC2</u>
Serial Number	<u>AMU 1809</u>			Serial Number	<u>AMU 1659</u>
Last Verification Date	<u>October 19, 2019</u>			Temp. °C	<u>24.5 C</u>
Gas Type	<u>NO</u>	Conc.	<u>48.79</u>	B.P.	<u>706 mmhg</u>
Cylinder Number	<u>CAL018188</u>				
Expiry Date	<u>March 2019</u>				

Reference Analyzer:

Make/Model Teco 42i Serial/AMU Number: 1868

Instrument Settings Zero: 4.4 Span: 1.080 Range: 1.0

Last Calibration: Date: Oct 18/16 C.F. 1.000 Done By: Al Clark

Calibrator Flows (sccm)		Indicated Conc. (ppm)		Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration	
Dilution	Gas	NO	NOX			NO	NOX
5000	0.0	0.000	0.000				
4935	82.0	0.838	0.837	0.017	60.183	50.4	50.4
4968	40.8	0.417	0.417	0.008	121.765	50.8	50.8
4955	20.2	0.207	0.207	0.004	245.297	50.8	50.8
Average Cylinder Concentration:						50.7	50.6

<u>NO</u>	<u>NOx</u>
Previous Stated Concentration PPM: <u>50.7</u>	<u>50.9</u>
Percent variance from Stated: <u>0</u>	<u>1</u>

Cylinder gas tolerances based on NO only

Meets Manufacturer Tolerance. Use manufacturers stated concentration **COMMENTS:**

< =5% Outside Manufacturer Tolerance. Use manufacturers concentration Contains 50.6 ppm SO2.

> 5% Outside Manufacturer Tolerance. **DO NOT USE** this cylinder

Auditor: Al Clark Date: October 19, 2016

Operator Signature: *Al Clark* Location: McIntyre Center Edmonton

***APPENDIX III
REPORT CERTIFICATION FORM***

Report Certification Form

Alberta Airshed (if applicable)	EPA Approval or Code of Practice Registration # (if applicable)
YES	NA
Company Name (if applicable)	Industrial Operation Name (if applicable)
Lakeland Industry & Community Association	Maskwa Continuous Monitoring Station
Name of the Representative of the Person Responsible (Last, First, Middle)	Position / Title of the Representative of the Person Responsible
Nazek AL-Hadi	Project Manager Assistant, Customer Service, Air Services
Is an External Party Certifying the Report? (If 'Yes', fill in the fields below for the external person.)	
<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Name of External Person Certifying the Report (Last, First, Middle)	Position / Title of External Person Certifying the Report
NA	NA
Company Name for the External Person Certifying the Report	Identification of Qualifications / Professional Designations of the External Person Certifying the Report
NA	NA

I certify that I have reviewed and verified the submitted report. I also certify that the report presented with this certification form is complete, accurate and representative of the monitoring results and timeframe.

Nazek AL-Hadi

Signature of the Representative of the Person Responsible / External Person Certifying the Report

November 30, 2017

Report Issued Date (dd-mm-yyyy)

APPENDIX IV
DATA VALIDATION CERTIFICATION FORM



Validation Certificate Form

Client: <u>Lakeland Industry & Community Association</u>	Project #: <u>2833-2017-10-30-C</u>
Site: <u>Maskwa Continuous Monitoring Station</u>	Contact: <u>Mike Bisaga</u>

Level 0 Preliminary Verification	<u>Nazek AL-Hadi</u>	Date <u>November 24, 2017</u>
Level 1 Primary Validation	<u>Nazek AL-Hadi</u>	Date <u>November 24, 2017</u>
Level 2 Final Validation	<u>Nazek AL-Hadi</u>	Date <u>November 30, 2017</u>
Level 3 Independent Data Review	<u>CSA-Lmhq</u>	Date <u>November 30, 2017</u>
Post-Final Validation	<u>NA</u>	Date <u>NA</u>

Notes
The Post-Final Validation step serves to re-evaluate the data that errors or omissions are discovered and/or suspected after the initial submittal of data. This validation is performed on an annual basis.



Alberta Environment and Parks (AEP)
Air.Reporting@gov.ab.ca

December 13, 2017

Subject: Monthly Report Submission for the LICA St. Lina station

Lakeland Industry & Community Association (LICA) is pleased to submit the ambient air monitoring monthly report for the LICA St. Lina AQM Station in the month of October 2017.

The air monitoring program consists of continuous air monitoring results for Sulphur Dioxide (SO₂), Hydrogen Sulphide (H₂S), Total Hydrocarbon (THC), Oxides of Nitrogen (NO_x), Nitric Oxides (NO), Nitrogen Dioxide (NO₂), Ozone (O₃), Particulate Matter 2.5 (PM_{2.5}), Relative Humidity (RH), Barometric Pressure (BP), Precipitation, Ambient Temperature (AmbTPX), Wind Speed (WS), Wind Direction (WD) and Standard Deviation Wind Direction (STDWD).

Sampling Program	Monitoring Activities Conducted By	Sample Analysis Conducted By	Data/Report Review and Prepared By	Electronic Submission Conducted By
Continuous ambient air	Maxxam Analytics	Maxxam Analytics	Maxxam Analytics	Maxxam Analytics

All data collected in October 2017 was compliant with the requirements outlined in the Air Monitoring Directive (Alberta Environment and Parks, 2016).

The operational time for all continuous ambient air analyzers, meteorological systems and data acquisition systems were above the 90% requirement systems, with the exception of THC.

Non-Conformance: The THC analyzer failed a shut-down calibration on October 25. A large variance was noticed in the analog output which may have contributed to the failed shut-down. Troubleshooting was performed on October 25 and a post-repair calibration was completed on October 26. As a clear point of failure could not be determined, data was invalidated back to the last valid calibration on October 5. 504 hours of downtime were recorded. Equipment uptime was 32.2%. AEP reference number: 331446.

As the LICA Environmental Program Manager and Data & Reporting Specialist, we certify that we have reviewed and verified this report and that the information is complete, accurate and representative of the monitoring results, reporting timeframe and the specified analysis, summarization and reporting requirements. We also certify all air data that are required by the AMD to be electronically submitted to AEP and Alberta's Ambient Air Quality Data Warehouse have been submitted by the time of this report submission.

Should you have any questions, please don't hesitate to contact me.



Lakeland Industry & Community Association
5107 50 St
Bonnyville, AB T9N 2J7

Respectfully,

A handwritten signature in blue ink that reads 'Michael Bisaga'.

Michael Bisaga
Technical Program Manager
Lakeland Industry & Community Association
780-266-7068
mbisaga@otonabee.ca

A handwritten signature in blue ink that reads 'Lily Lin'.

Lily Lin
Data & Reporting Specialist
587-225-2248
rebbacaa@gmail.com



MAXXAM ANALYTICS
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T2E 6P7

maxxam.ca
Toll Free 800-386-7247
Fax 403-219-3673

**AMBIENT AIR MONITORING MONTHLY DATA REPORT
LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
ST. LINA CONTINUOUS MONITORING STATION**

JOB #: 2833-2017-10-31-C

October 2017

Prepared for:

LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
5107 50 ST.
BONNYVILLE, ALBERTA
T9N 2J7

Attention: MIKE BISAGA

DATE: **December 1, 2017**

Prepared by: *Maram Ghaleb*

Maram Ghaleb, B.Sc.
Project Manager, Customer Service, Air Services

Reviewed by: *Wunmi Adekanmbi*

Wunmi Adekanmbi, M.Sc., EPT.
Project Manager, Customer Service, Air Services

SUMMARY

In October 2017, Maxxam Analytics was contracted to manage the ambient air quality monitoring and maintenance activities at the St. Lina Continuous Monitoring Station, near Bonnyville, Alberta. The monitoring station provides continuous meteorological measurements and air quality data for non-compliance parameters, as requested by the Lakeland Industry and Community Association.

All data collected this month was compliant with the requirements outlined in the Air Monitoring Directive (Alberta Environment and Parks, 2016).

The operational time for all continuous ambient air analyzers, meteorological systems and data acquisition systems, with the exception of THC, were above the 90% requirement. This event was reported to AEP under reference number 331446.

Non-Conformance: The THC analyzer failed a shut-down calibration attempt on October 25. Data was invalidated back to the last valid calibration on October 5. 504 hours of downtime were recorded. Equipment uptime (32.2%) did not meet the AMD's 90% requirement this month. This event was reported to AEP under reference number: 331446.

H₂S: Fifteen hours of downtime were recorded due to additional quality checks performed on October 8 at 07:00, October 12 at 07:00-08:00, October 18 at 06:00, and October 19 at 7:00, to address drifts in zero and span response. Repeat calibrations were also performed on October 20 and 26.

NO_x/NO/NO₂: Scheduled automatically daily zero-span checks failed to execute due to a software error from October 26-31. Manual zero-span checks were triggered to provide valid daily quality control data. Nine hours of downtime were incurred as a result.

PM_{2.5}: A "low concentration" alert prompted a site visit on October 10, where electrical connections were adjusted. One hour of downtime was incurred.

WS/WD: Data collected on October 25 at hour 13:00 was invalidated due to an anomalous spike resulting in one hour of downtime.

The summary of results is presented on the following pages.

Any deviations or modifications made to the sampling or analytical methods are outlined in Section 1.0, Discussion. On this basis, Maxxam Analytics is issuing this completed report to Lakeland Industry & Community Association, St. Lina Continuous Monitoring Station.

Should you have any questions concerning the results or if we can be of further assistance, please contact us at 403-219-3677 or toll-free at 1-800-386-7247.

Monthly Continuous Data Summary

Lakeland Industry & Community Association						MAXIMUM VALUES							OPERATIONAL TIME (%)
St. Lina Continuous Monitoring Station						1-HOUR				24-HOUR			
PARAMETER	OBJECTIVES		EXCEEDANCES		MONTHLY AVERAGE	READING	DAY	HOUR	WIND SPEED (kph)	WIND DIRECTION (sector)	READING	DAY	
	1-hr	24-hr	1-hr	24-hr									
SO ₂ (ppb)	172	48	0	0	0	2	14	11	13.4	SW	1	17	100.0
H ₂ S (ppb)	10	3	0	0	0	2	20	13	7.9	NW	1	20	98.0
THC (ppm)	-	-	-	-	2.02	3.00	31	14	9.0	ESE	2.30	31	32.3
NO ₂ (ppb)	159	-	0	-	1	11	10	15	12.9	NE	3	10	98.8
NO (ppb)	-	-	-	-	0	3	14	14	13.4	SW	0	1	98.8
NO _x (ppb)	-	-	-	-	1	12	10	14	10.9	NE	3	10	98.8
O ₃ (ppb)	82	-	0	-	25.3	42.0	5	15	17.1	SSW	34.2	21	100.0
PM _{2.5} (µg/m ³)	80	30	0	0	2	27	4	17	3.8	NNE	7	27	99.9
RELATIVE HUMIDITY (%)	-	-	-	-	67	89	1	6	12.7	NW	87	11	100.0
BAROMETRIC PRESSURE (millibar)	-	-	-	-	925	942	23	15	15.2	W	938	26	100.0
AMBIENT TEMPERATURE (°C)	-	-	-	-	2.9	17.8	5	14	18.3	SSW	9.3	24	100.0
PRECIPITATION (mm)	-	-	-	-	0.1	3.7	17	17	24.9	WNW	0.9	1	100.0
VECTOR WS (kph)	-	-	-	-	6	33	24	7	-	WSW	21	2	99.9
VECTOR WD (sec)	-	-	-	-	282 (W)	-	-	-	-	-	-	-	99.9

Exceedance Summary Report

SO₂ 1-Hour Exceedances

Measured concentrations of sulphur dioxide were below the 1-hour AAAQO of 172 ppb.

SO₂ 24-Hour Exceedances

Measured concentrations of sulphur dioxide were below the 24-hour AAAQO of 48.0 ppb.

H₂S 1-Hour Exceedances

Measured concentrations of hydrogen sulphide were below the 1-hour AAAQO of 10 ppb.

H₂S 24-Hour Exceedances

Measured concentrations of hydrogen sulphide were below the 24-hour AAAQO of 3 ppb.

NO₂ 1-Hour Exceedances

Measured concentrations of nitrogen dioxide were below the 1-hour AAAQO of 159 ppb.

PM_{2.5} 1-Hour Exceedances

Measured concentrations of fine particulate matter were below the 1-hour AAAQO of 80 µg/m³.

PM_{2.5} 24-Hour Exceedances

Measured concentrations of fine particulate matter were below the 24-hour AAAQO of 30 µg/m³.

O₃ 1-Hour Exceedances

Measured concentrations of ozone were below the 1-hour AAAQO of 82 ppb.

In accordance with EPEA and the Substance Release Regulation.

In accordance with A Guide to Release Reporting and the Alberta Ambient Air Quality Objectives and Guidelines Summary.

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1.0 Discussion

This monthly report consists of continuous monitoring results for the following parameters: Sulphur Dioxide (SO₂), Hydrogen Sulphide (H₂S), Total Hydrocarbon (THC), Oxides of Nitrogen (NO_x), Nitric Oxides (NO), Nitrogen Dioxide (NO₂), Ozone (O₃), Particulate Matter 2.5 (PM_{2.5}), Relative Humidity (RH), Barometric Pressure (BP), Precipitation, Ambient Temperature (AmbTPX), Wind Speed (WS), Wind Direction (WD) and Standard Deviation Wind Direction (STDWD).

The sample inlet filter for all continuous air analyzers are replaced before the calibration begins. The sample manifold is cleaned during the site visit each month.

Control checks, consisting of a zero and span, are conducted daily on all continuous air monitors. In place of the air sample, zero air (from scrubbed air or gas cylinders) is used for zero checks, and a known concentration of the pollutant being analyzed is used for span checks. These checks are controlled by automatic timers and valves. The total zero span cycle is completed within an hour, the commencement of the zero span cycle is at the beginning of the hour.

Multipoint calibrations are done a minimum of once a month for each continuous air monitor. An additional calibration is required under the following conditions: 1) within three days after the initial start-up and stabilization of a newly installed instrument, 2) prior to shut-down or moving of an instrument which has been working to specification, and 3) when major repair has been done on the instrument.

Time during the first multi-point calibration is not considered downtime (Data is flagged as C). If more than one calibration is performed during the month, the time during the additional calibration is considered as downtime (Data is flagged as C1).

Only one zero/span check is run per day. Time during the zero/span check is not considered as downtime (Data is flagged as S). If an extra zero/span check is performed, the time during the additional check is considered as downtime (Data is flagged as S1).

The AMD requires each instrument and accompanying data recording system to be operational 90% of the time, at a minimum, for each monthly monitoring period.

All sampling, analysis, and QA/QC for this project was performed by Maxxam Analytics and complies with the Alberta Air Monitoring Directive.

Data contained in this monthly report has undergone the verification and validation based on the requirements of the AMD Chapter 6: Ambient Data Quality (December, 2016). The descriptions of the data verification and validation process can be found in Section 5 of this report. Instantaneous data, where applicable, is provided for reference purposes and has not undergone zero correction. The minimum and maximum statistics are highlighted in the data table and are for reference only. The highlighted cells are based on the software's interpretation of the exact position of the minimum or maximum value. The visual presentation of these statistics may not be the obvious choice in a data range due to rounding, truncating or analyzer specifications.

Hourly/minute data have been reviewed based on daily zero/span results and multi-point calibration results. Data may be considered invalid if a zero-corrected span check in excess of +/- 10% of the span concentration (established by the previous multi-point calibration) is encountered and/or significant differences in the calibration factor occurs (greater than 10%).

SULPHUR DIOXIDE (SO₂)

- Operational time, for the monitoring period was 100%.
- The routine monthly calibration was performed on October 4.
- The O₃ and SO₂ span programs are designed to run concurrently. One instance of quality check was recorded on the SO₂ channel on October 5 at hour 13:00 due to activities on the O₃ channel.

HYDROGEN SULPHIDE (H₂S)

- Operational time, for the monitoring period was 98.0%, equivalent to 15 hours of downtime.
- The routine monthly calibration was performed on October 4.
- Repeat zero-span checks were performed on October 8 at 07:00, October 12 at 07:00-08:00, and October 18 at 06:00-07:00, as the analyzer spanned towards the upper acceptance limit on October 6, October 7, October 11 and October 17. The results were well within limits, no further action was required. Five hours of downtime were recorded due to the additional zero-span checks.
- The analyzer then spanned beyond the upper acceptance limit on October 19. A repeat zero-span check triggered on October 20 confirmed the drift. This prompted an immediate site visit where a successful repeat calibration was completed. Six hours of downtime were recorded due to this event.
- The analyzer began to exhibit a negative zero drift on October 23. A repeat calibration was performed on October 26 as a precautionary measure. Four hours of downtime were incurred as a result.
- Since a clear cause for the drift could not be determined at this point, the analyzer will be monitored and further action will be taken if the analyzer continues to exhibit this issue.

TOTAL HYDROCARBONS (THC)

- Operational time, for the monitoring period was 32.3%, equivalent to 504 hours of downtime.
- The routine monthly calibration was performed on October 5.
- In response to a zero drift, a shut-down calibration was attempted on October 25 but it failed at mid-point. This result was confirmed with an alternate calibration set-up. A large variance was noticed in the analog output which may have contributed to the failed shut-down. The analyzer's output was recalibrated. The sample pump was rebuilt and the gas pressures were checked and adjusted for IZS to ensure sufficient gas flow. The analyzer was allowed to stabilize overnight and a post-repair calibration was completed on October 26 after the accuracy of the analog output and IZS gas flow have been confirmed. A clear point of failure could not be determined, therefore data was invalidated back to the last valid calibration which was on October 5. 504 hours of downtime were incurred. Equipment uptime did not meet the AMD's 90% requirement. This event was reported to AEP under reference number 331446.
- Arrangements have been made to replace the analyzer in November for further off-site troubleshooting and maintenance.

OXIDES OF NITROGEN (NO_x), NITRIC OXIDE (NO) and NITROGEN DIOXIDE (NO₂)

- Operational time, for the monitoring period was 98.8%, equivalent to 9 hours of downtime.
- The routine monthly calibration was performed on October 4.
- Starting from October 26, the scheduled automated daily zero-span check failed to execute correctly. However, the manually-triggered zero-span checks were successfully completed. The issue was traced to a software error and was solved on November 1 by reprogramming the software. Nine hours of downtime were recorded between October 27 and October 31 due the manually-triggered zero-span checks.

OZONE (O₃)

- Operational time, for the monitoring period was 100%.
- The O₃ and SO₂ span programs are designed to run concurrently. An additional quality check was recorded on the O₃ channel on October 4 at hour 15:00 due to activities on the SO₂ channel.
- The routine monthly calibration was performed on October 5.

PARTICULATE MATTER < 2.5 MICRONS (PM_{2.5})

- Operational time, for the monitoring period was 99.9%, equivalent to one hour of downtime.
- A "low concentration" alert prompted a site visit on October 10, where electrical connections were adjusted. One hour of downtime was incurred. Hourly data was not impacted.
- The routine monthly audits were performed on October 16.
- Data was corrected in accordance with AMD (2016), Chapter 6, Table 2, Zero Adjustment Criteria. Data recorded between 0 and -3 µg/m³ were corrected to 0 µg/m³. No hourly data were invalidated as all measurements were above -3 µg/m³ this month.

WIND SPEED (WS), WIND DIRECTION (WD) and STANDARD DEVIATION WIND DIRECTION (STDWD)

- Operational time, for the monitoring period was 99.9%, equivalent to one hour of downtime.
- Data collected on October 25 at hour 13:00 was invalidated as it was considered an anomalous spike, which was not consistent with wind data recorded in the Cold Lake area at that period.
- Due to a brief power failure, one hour of maximum instantaneous data was discarded on October 20, at hour 03:00.
- Maximum instantaneous data were invalidated on October 1 at hour 21:00, October 2 at hour 06:00 and October 11 at hour 13:00 as they were considered anomalous spikes.
- Wind data is reported as vector wind speed and vector wind direction. Wind direction is defined as the direction from which the wind is blowing and is measured in degrees from true north.

RELATIVE HUMIDITY (RH)

- Operational time for the monitoring period was 100%.

BAROMETRIC PRESSURE (BP)

- Operational time for the monitoring period was 100%.

PRECIPITATION (PRECIP)

- Operational time for the monitoring period was 100%.
- The precipitation sensor was audited on October 5. The results were satisfactory.

AMBIENT TEMPERATURE (AmbTPX)

- Operational time for the monitoring period was 100%.

2.0 Project Personnel

Mike Bisaga was the contact for Lakeland Industry & Community Association and the Maxxam field technicians were Alexander Yakupov and Christopher Wesson.

3.0 Plant Monthly Required AMD Summary

All data collected this month was compliant with the requirements outlined in the Air Monitoring Directive (Alberta Environment and Parks, 2016).

The operational time for all continuous ambient air analyzers, meteorological systems and data acquisition systems, with the exception of THC, were above the 90% requirement. This event was reported to AEP under reference number 331446.

4.0 Calculations and Results

All calculations and reporting of results follow the methods described in the AMD, 2016.

5.0 Methods and Procedures

The following methods and procedures were used to complete the monitoring program:

- Maxxam AIR SOP-00209: Ambient Sulphur Monitoring
- Maxxam AIR SOP-00212: Ambient O₃ Monitoring
- Maxxam AIR SOP-00213: Ambient NO/NO₂/NO_x Monitoring
- Maxxam AIR SOP-00214: Ambient Hydrocarbon (THC) Monitoring
- Maxxam AIR SOP-00242: Precipitation Collector Installation/Maintenance
- Maxxam AIR SOP-00010: Thermo Model 5030i SHARP Monitor
- MET One Instruments: Operation Manual Document No. 50.5-9800

There were no deviations from the prescribed methods.

The following instruments were used to perform the test program:

- Sulphur Dioxide - API 100E UV Fluorescent Analyzer
- Hydrogen Sulphide - API 101E UV Fluorescent Analyzer
- Total Hydrocarbons - Thermo 51C FID Analyzer
- Oxides of Nitrogen - API 200E Chemiluminescent Analyzer
- Ozone - Thermo 49i Photometric Analyzer
- Particulate Matter (PM_{2.5}) - Thermo 5030i SHARP Unit
- Wind System - Met One Unit
- Relative Humidity - Met One Unit
- Barometric Pressure - Met One Unit
- Ambient Temperature - Met One Unit
- Precipitation - Met One Unit
- Datalogger - ESC 8832

The following steps were used to complete the data verification and validation process:

Level 0 Preliminary Verification

Level 0 data are raw data obtained directly from the data acquisition system (DAS). Under the step of Level 0, these data undergo a certain amount of manual or automated screening and flagging. It included a) identification of periods of missing data; b) verification of time stamps against reference time; c) verification that instrument diagnostics/datalogger flags indicate normal operation; d) comparison of data to upper and lower limits; e) rate of change flagging indicating that data changed too rapidly or not at all; and f) verification that zero, span and multipoint performance checks are within specifications. This level of verification is performed on a daily basis.

Level 1 Primary Validation

Validation actions under the step of Level 1 include a) review of all screening flags assigned during preliminary verification; b) review of all supporting site information and documentation; c) review of operational acceptance limits for each parameter/analyzer; d) review of daily zero/span and monthly calibration results for all gaseous parameters; and e) application of any necessary adjustments to data (e.g. baseline adjustments, below zero adjustments). This level of validation is performed on a monthly basis.

Level 2 Final Validation

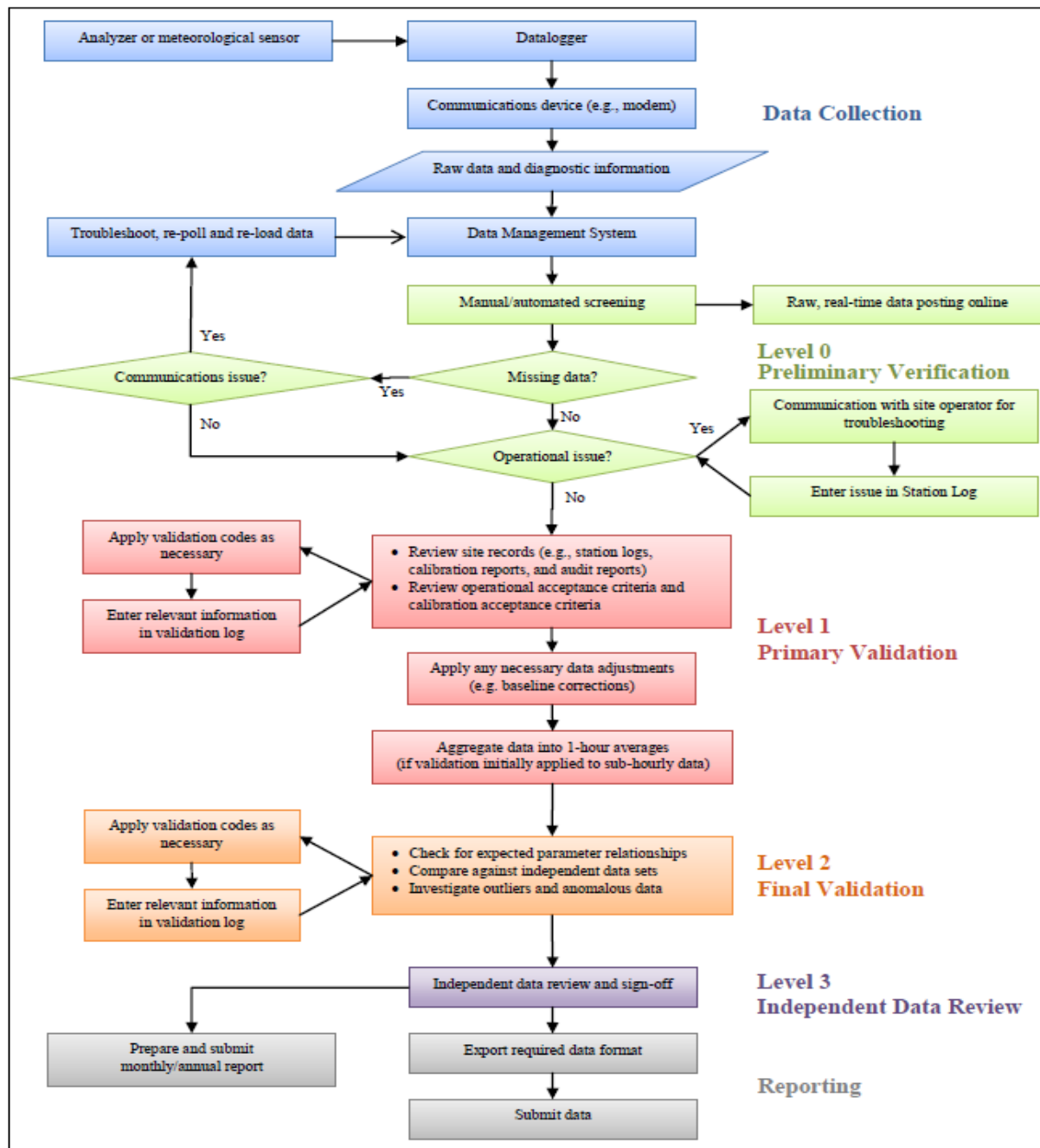
The purpose of Level 2 validation is to verify that there are no inconsistencies among related data, or among regional data measured at nearby sites.

Level 3 Independent Data Review

Level 3 validation is the last step of data review, and it is completed by an individual that is independent of both field operations and primary data validation. A final independent QA review and endorsement is performed during this step before data is submitted to Alberta Environment.

Post-Final Validation

The Post-Final Validation step serves to re-evaluate the data that errors or omissions are discovered and/or suspected after the initial submittal of data. Any data issues or patterns which were not clear on a monthly basis are highlighted during this step. This validation is performed on an annual basis.



Source: Air Monitoring Directive (December 2016), Chapter 6, Ambient Data Quality; Figure 1 Data Collection and Management Process Flow Chart

APPENDIX I
CONTINUOUS MONITORING DATA RESULTS

SULPHUR DIOXIDE

SULPHUR DIOXIDE Hourly Averages (SO₂ ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.		
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.			
DAY																														
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	24			
2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	24			
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	1	0	1	0	24	
4	1	0	1	1	0	0	0	0	0	0	0	C	C	C	C	C	0	1	0	S	0	0	0	0	0	0	1	0	24	
5	0	0	0	0	0	0	0	0	0	0	0	0	0	Q	0	0	0	0	0	S	0	0	0	0	0	0	0	0	24	
6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	S	0	0	1	0	1	1	1	0	1	0	24	
7	0	1	0	1	1	0	0	0	1	1	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	1	0	24
8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	24
9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
10	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	1	1	1	0	0	0	0	0	0	0	0	1	0	24
11	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
12	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
13	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
14	0	0	0	0	0	0	0	0	0	S	1	2	2	1	1	1	1	1	0	0	0	0	0	0	0	0	0	2	0	24
15	0	0	0	0	0	0	0	0	S	0	1	1	0	0	0	1	1	1	1	1	1	1	1	1	1	1	0	1	0	24
16	1	1	1	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24
17	0	0	0	0	0	1	S	1	1	1	1	1	2	2	2	2	2	1	1	1	1	1	1	0	0	0	2	1	0	24
18	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
19	0	0	0	0	S	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	24
20	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
21	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
22	0	S	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	1	1	0	24
23	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	24
24	0	1	0	0	1	1	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	2	0	24	
25	1	1	1	1	1	1	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	S	0	0	0	2	1	24	
26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	24
27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	24
28	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	1	0	24
29	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	24
30	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	1	0	24
31	0	0	0	0	0	0	0	0	0	0	1	1	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
HOURLY MAX	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	24
HOURLY AVG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24

STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

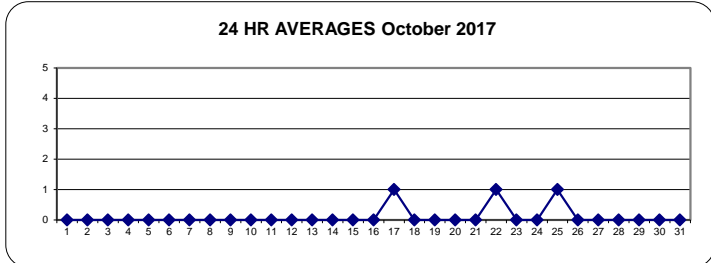
OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT:	1-HR	172	ppb	24-HR	48	ppb
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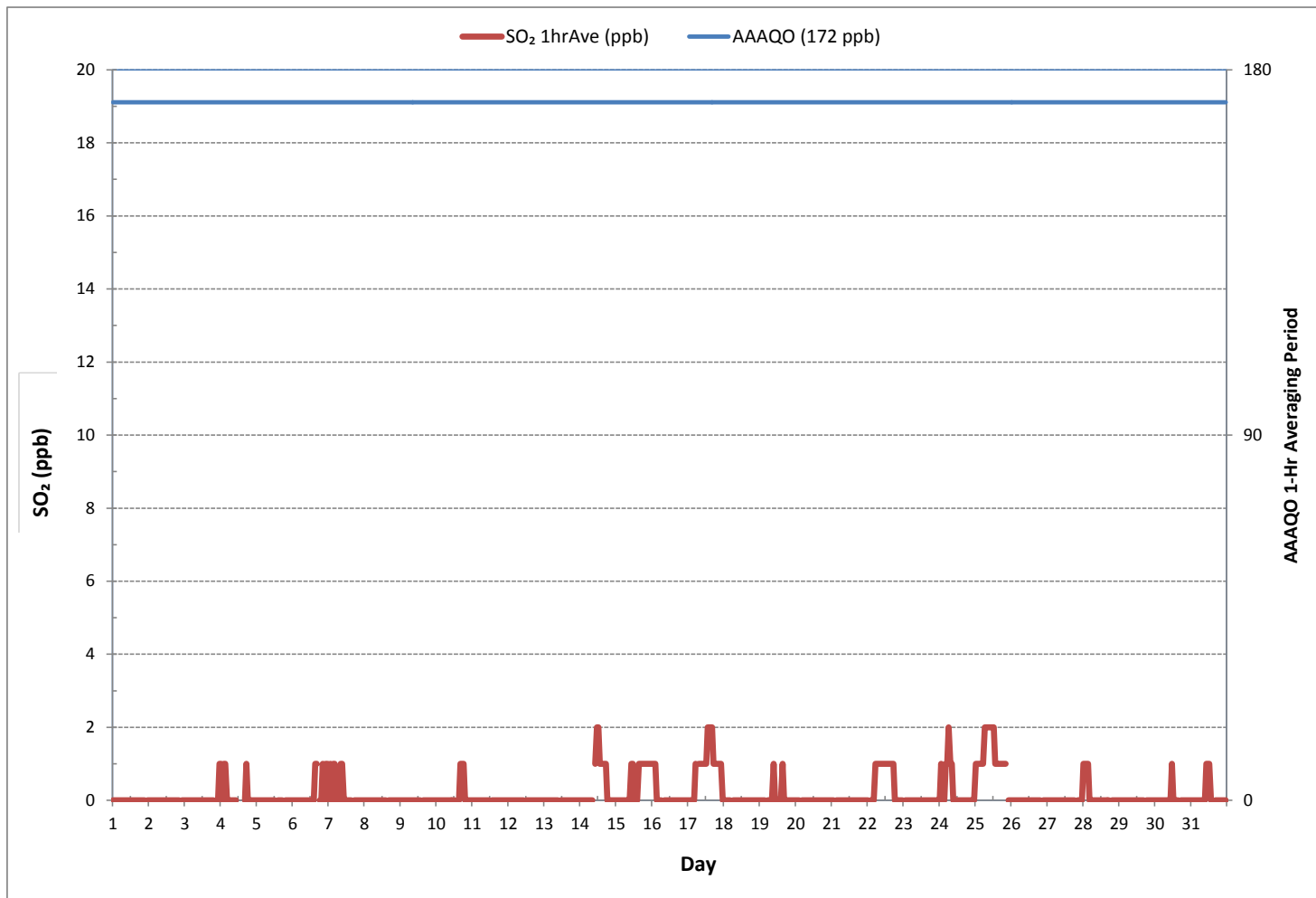
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0
NUMBER OF 24-HR EXCEEDANCES:	0
NUMBER OF NON-ZERO READINGS:	107
MINIMUM 1-HR AVERAGE:	0 ppb @ HOUR ON DAY 1
MAXIMUM 1-HR AVERAGE:	2 ppb @ HOUR 11 ON DAY 14
MAXIMUM 24-HR AVERAGE:	1 ppb ON DAY 17
IZS CALIBRATION TIME:	32 hrs
MONTHLY CALIBRATION TIME:	5 hrs
OPERATIONAL TIME:	744 hrs
AMD OPERATION UPTIME:	100.0 %
STANDARD DEVIATION:	0
MONTHLY AVERAGE:	0 ppb

24 HR AVERAGES October 2017



SULPHUR DIOXIDE Hourly Averages (SO₂ ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
St. Lina Continuous Monitoring Station - October 2017

SULPHUR DIOXIDE Instantaneous Maximum (SO₂ ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.		
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.			
DAY 1	3	4	4	4	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	S	3	3	4	3	24		
2	2	2	3	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	S	1	2	1	3	2	24	
3	2	2	1	2	1	1	2	2	2	1	2	2	2	2	2	2	2	2	2	2	2	S	2	2	3	1	3	2	24	
4	3	2	2	2	2	2	2	2	2	2	2	C	C	C	C	C	2	3	2	S	2	2	2	2	2	2	3	2	24	
5	2	2	2	2	2	2	2	2	3	3	3	3	2	Q	3	3	3	3	S	3	3	3	3	3	3	2	3	3	24	
6	3	3	3	3	3	4	4	4	4	4	4	4	4	4	5	5	5	S	5	5	5	5	5	5	5	3	5	4	24	
7	5	5	5	5	5	5	4	5	5	5	4	4	4	4	4	4	S	4	4	4	4	4	4	4	4	4	5	4	24	
8	4	4	3	3	3	3	3	3	3	3	3	3	3	3	3	S	2	2	2	2	2	2	3	3	2	4	3	24		
9	2	2	3	3	2	3	3	3	3	3	3	3	3	3	S	3	3	3	3	3	3	3	3	3	3	2	3	3	24	
10	3	3	3	3	3	3	3	3	3	3	3	3	3	S	3	3	4	4	4	4	4	4	3	4	3	3	4	3	24	
11	3	3	3	4	4	4	4	3	3	3	3	3	S	4	4	3	3	3	3	3	3	4	3	3	3	3	4	3	24	
12	3	3	3	3	3	3	3	3	3	3	3	S	3	3	3	3	3	3	3	3	3	3	3	2	2	2	3	3	24	
13	3	3	3	2	3	2	2	2	2	3	S	2	2	2	2	2	2	2	2	2	2	2	3	2	2	2	3	2	24	
14	2	2	2	3	3	3	3	3	3	S	4	4	4	4	3	3	3	3	3	3	3	3	3	3	3	2	4	3	24	
15	3	3	3	3	3	3	3	3	3	S	3	4	3	3	3	4	3	4	3	4	3	4	4	4	4	4	3	4	3	24
16	4	4	4	4	4	4	4	S	3	3	4	3	4	3	4	4	4	4	4	4	4	4	4	4	4	3	4	4	24	
17	4	4	4	4	4	4	S	6	6	5	5	5	6	6	6	6	6	5	5	5	5	5	5	5	4	6	5	4	24	
18	4	4	4	4	4	S	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	5	4	24	
19	5	5	5	5	S	5	5	5	5	6	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	6	5	24	
20	5	5	5	P	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	23	
21	5	5	S	5	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	5	4	24	
22	5	S	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	4	4	4	4	4	4	4	4	4	5	5	24	
23	S	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	2	3	2	3	3	3	S	S	2	3	3	24	
24	3	3	3	3	3	5	5	4	3	3	3	3	3	3	3	3	3	3	3	3	3	3	S	4	3	5	3	24		
25	4	4	4	4	4	5	5	5	5	4	4	4	4	4	4	3	3	3	3	3	3	S	3	3	3	5	4	24		
26	2	2	2	2	2	2	2	2	2	3	2	3	3	3	3	3	3	3	3	3	3	S	3	3	3	2	3	3	24	
27	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	4	4	4	4	S	4	4	4	4	3	4	3	24	
28	4	5	5	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	S	4	4	4	4	4	4	4	5	4	24	
29	4	3	3	3	3	3	3	3	3	3	3	3	3	3	3	S	2	2	2	2	2	3	2	2	2	2	4	3	24	
30	2	2	2	3	3	3	3	3	3	3	4	5	4	3	3	S	3	3	4	4	4	4	4	4	4	2	5	3	24	
31	4	4	4	4	4	4	4	5	5	5	5	6	6	6	5	S	5	5	5	5	5	5	5	5	5	4	6	5	24	
HOURLY MAX	5	5	5	5	5	5	5	6	6	6	5	6	6	6	6	6	6	5	5	5	5	5	5	5	5	5	5	5	24	
HOURLY AVG	3	3	3	3	3	3	3	3	3	3	3	4	4	4	4	4	3	3	3	3	3	4	4	3	4	4	4	4	24	

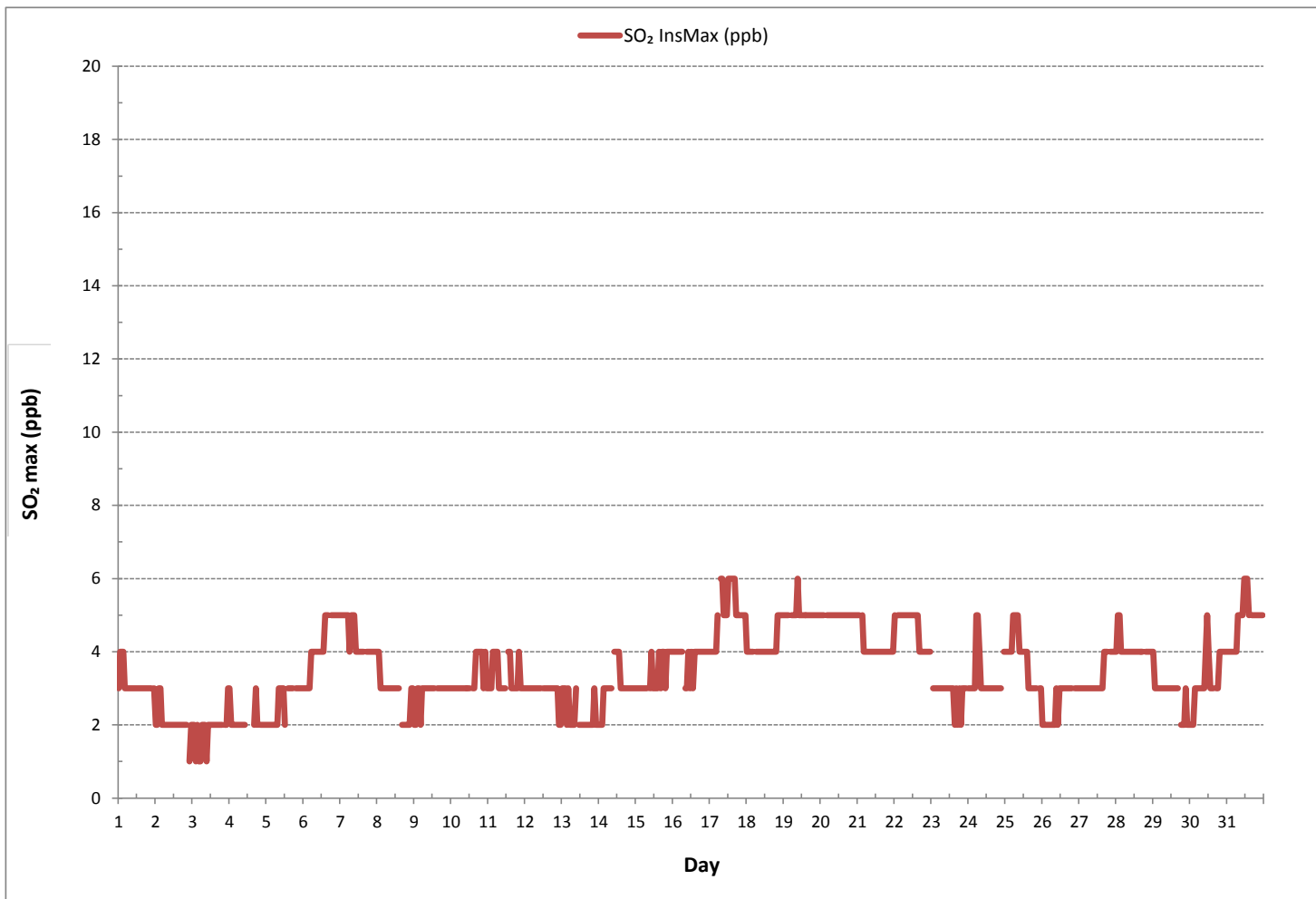
STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	706
MAXIMUM INSTANTANEOUS VALUE:	6 ppb @ HOUR 7 ON DAY 17
IZS CALIBRATION TIME:	31 hrs
MONTHLY CALIBRATION TIME:	5 hrs
STANDARD DEVIATION:	1
OPERATIONAL TIME:	743 hrs

SULPHUR DIOXIDE Instantaneous Maximum (SO₂ ppb)



Wind: LICA ST. LINA
 Poll.: LICA ST. LINA-SO₂[ppb]
 Monthly: 17/10
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 0.57%

Calm Avg: 0.04 [ppb]

Direction	0.0-0.6	0.6-1.2	1.2-1.8	1.8-2.4	2.4-3.0	>3.0	Total
N	7.2	0.4	0.0	0.0	0.0	0.0	7.7
NE	3.3	0.4	0.6	0.0	0.0	0.0	4.3
E	4.4	1.0	0.7	0.0	0.0	0.0	6.1
SE	3.8	0.1	0.3	0.0	0.0	0.0	4.3
S	10.9	0.9	0.3	0.0	0.0	0.0	12.1
SW	18.6	2.1	0.6	0.0	0.0	0.0	21.3
W	15.7	1.6	0.1	0.0	0.0	0.0	17.4
NW	24.8	0.9	0.4	0.3	0.0	0.0	26.4
Summary	88.8	7.4	3.0	0.3	0.0	0.0	99.4

% Icon Classes (ppb)

89 0.0-0.6

7 0.6-1.2

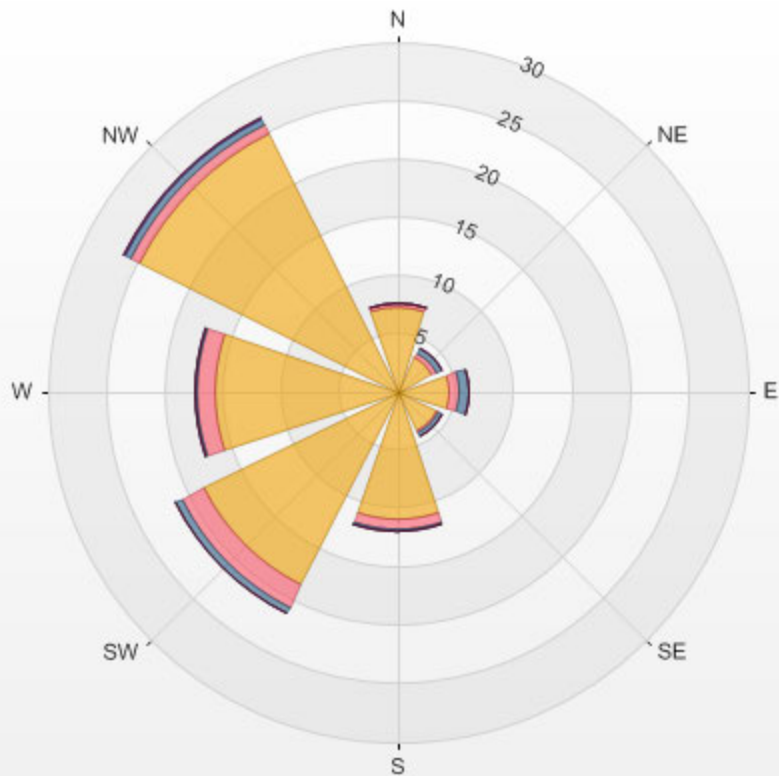
3 1.2-1.8

0 1.8-2.4

0 2.4-3.0

0 >3.0

LICA ST. LINA Poll.: LICA ST. LINA-SO2[ppb] 2017/10/01 00:00 - 2017/10/31 23:00 Calm: 0.57% Calm Poll Avg: 0.04[ppb]



SO2[ppb] Calibration: LICA ST. LINA Monthly: 17/10 Type: Span



■ Span Meas
 — Span Ref
 — Span Low
 — Span High

HYDROGEN SULPHIDE



HYDROGEN SULPHIDE Hourly Averages (H₂S ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.	
DAY																												
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	24
2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	24
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	24
4	0	0	0	0	0	0	0	0	0	0	0	0	C	C	C	C	0	0	0	0	S	0	0	0	0	0	0	24
5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	24
6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	24
7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	24
8	0	0	0	0	0	0	0	S1	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	23
9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	24
10	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	24
11	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	24
12	0	0	0	0	0	0	0	S1	S1	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	22
13	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
14	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
15	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
16	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
17	0	0	0	0	0	0	0	S	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	0	0	1	0	24
18	0	0	0	0	0	0	S	S1	S1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	22
19	0	0	0	0	0	S	0	0	S1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	23
20	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	C1	C1	C1	C1	C1	0	0	0	0	0	19
21	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
22	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
23	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	24
24	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	1	0	24
25	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	S	0	0	1	1	24
26	0	0	0	0	0	0	0	0	0	0	C1	C1	C1	C1	0	0	0	0	0	0	0	S	0	0	0	0	0	20
27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	24
28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
29	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	24
30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	24
31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	24
HOURLY MAX	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0				
HOURLY AVG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				

STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

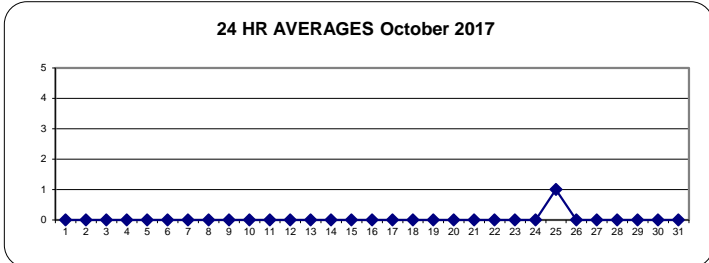
OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT:	1-HR	10	ppb	24-HR	3	ppb
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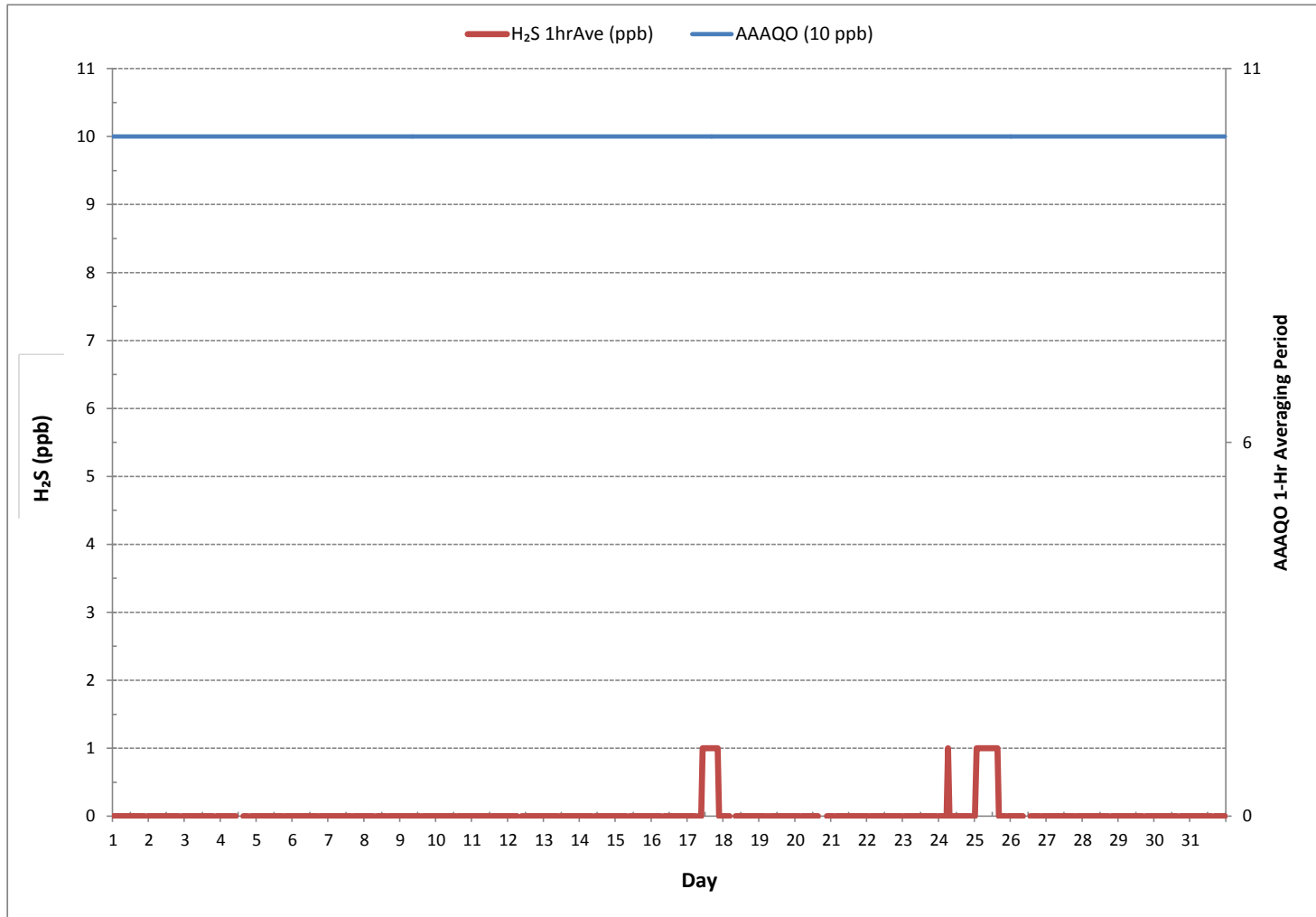
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0				
NUMBER OF 24-HR EXCEEDANCES:	0				
NUMBER OF NON-ZERO READINGS:	27				
MINIMUM 1-HR AVERAGE:	0 ppb @ HOUR	0	ON DAY	1	
MAXIMUM 1-HR AVERAGE:	1 ppb @ HOUR	10	ON DAY	17	
MAXIMUM 24-HR AVERAGE:	1 ppb		ON DAY	25	
IZS CALIBRATION TIME:	32	hrs	OPERATIONAL TIME:	729	hrs
MONTHLY CALIBRATION TIME:	4	hrs	AMD OPERATION UPTIME:	98.0	%
STANDARD DEVIATION:	0		MONTHLY AVERAGE:	0	ppb

24 HR AVERAGES October 2017



HYDROGEN SULPHIDE Hourly Averages (H₂S ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
St. Lina Continuous Monitoring Station - October 2017

HYDROGEN SULPHIDE Instantaneous Maximum (H₂S ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY																													
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	S	1	1	1	1	24	
2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	0	0	0	S	0	0	0	0	1	1	24
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	S	1	1	1	0	1	0	24	
4	1	1	1	1	1	1	1	1	1	1	1	C	C	C	C	C	0	0	1	S	1	1	1	1	0	1	1	24	
5	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	S	1	1	1	1	1	1	1	1	24	
6	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	S	2	2	2	2	2	2	2	1	2	2	24
7	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	S	2	2	2	2	2	2	2	1	1	2	2	24
8	1	1	1	1	1	1	S1	S1	1	1	1	1	1	1	1	1	S	1	1	1	1	1	1	1	1	1	1	1	22
9	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	S	1	1	1	1	1	1	1	1	1	1	1	1	24
10	1	1	1	1	1	1	1	1	1	1	1	1	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	24
11	1	1	1	1	1	1	1	1	1	1	1	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	24
12	1	1	1	1	1	1	1	S1	S1	1	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	22
13	1	1	1	1	1	1	1	1	1	1	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	24
14	1	1	1	1	1	1	1	1	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	24
15	1	1	1	1	1	1	1	1	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	24
16	1	1	1	1	1	1	1	S	1	1	1	1	1	1	1	1	1	1	1	2	1	2	2	2	1	2	1	24	
17	2	2	2	2	2	2	S	2	2	2	2	2	2	2	3	2	2	2	2	2	2	2	2	2	2	2	3	2	24
18	2	2	2	2	2	S	S1	S1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	1	2	2	2	22
19	2	2	2	2	S	2	S1	S1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	22
20	2	2	2	S	2	2	2	2	2	2	2	2	2	2	2	C1	C1	C1	C1	C1	0	0	0	0	0	2	2	19	
21	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
22	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
23	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	24
24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	24
25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	24
26	0	0	0	0	0	0	0	0	C1	C1	C1	C1	C1	0	0	0	0	0	0	0	0	S	0	1	0	0	1	0	19
27	1	0	0	1	0	0	0	0	0	0	1	0	0	0	1	1	1	1	1	S	1	1	1	1	0	1	1	1	24
28	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	S	1	1	1	1	1	1	1	1	2	1	24
29	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	1	0	24
30	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	S	1	1	1	1	1	1	1	1	0	1	0	24
31	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	S	2	2	2	2	2	2	2	2	1	1	2	1	24
HOURLY MAX	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	2	2	2	2	2	2	2	2	2	2	2	2	2
HOURLY AVG	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

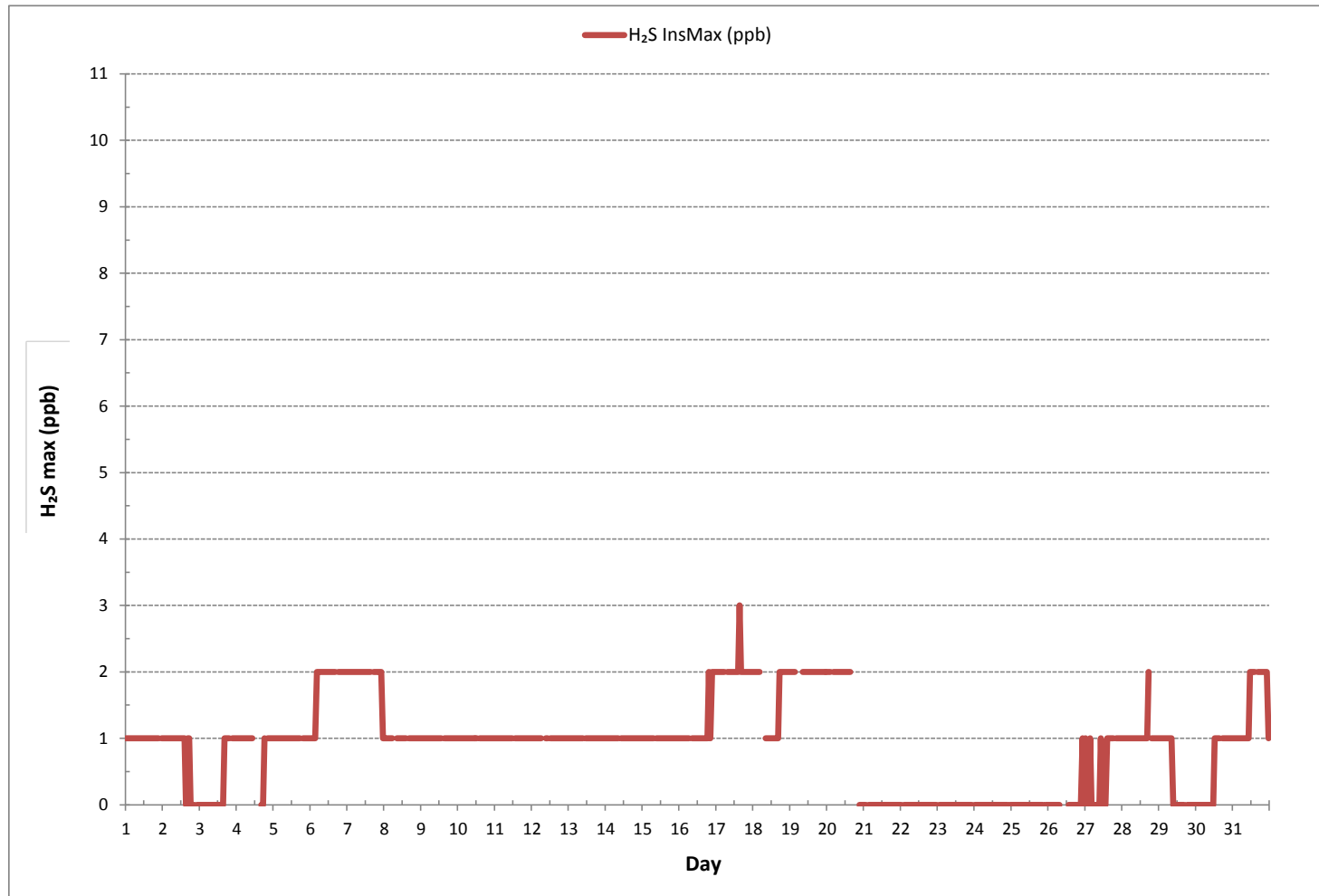
STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	494
MAXIMUM INSTANTANEOUS VALUE:	3 ppb @ HOUR 15 ON DAY 17
IZS CALIBRATION TIME:	32 hrs
MONTHLY CALIBRATION TIME:	5 hrs
OPERATIONAL TIME:	726 hrs
STANDARD DEVIATION:	1

HYDROGEN SULPHIDE Instantaneous Maximum (H₂S ppb)



Wind: LICA ST. LINA
 Poll.: LICA ST. LINA-H2S[ppb]
 Monthly: 17/10
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 0.58% Calm Avg: 0.06 [ppb]

Direction	0.0-0.6	0.6-1.3	1.3-1.9	>1.9	Total
N	7.5	0.1	0.0	0.0	7.7
NE	3.8	0.6	0.0	0.0	4.3
E	5.2	1.0	0.0	0.0	6.2
SE	4.1	0.3	0.0	0.0	4.3
S	12.1	0.1	0.0	0.0	12.3
SW	21.1	0.0	0.0	0.0	21.1
W	17.5	0.0	0.0	0.0	17.5
NW	25.6	0.4	0.0	0.0	26.0
Summary	96.8	2.6	0.0	0.0	99.4

% Icon Classes (ppb)

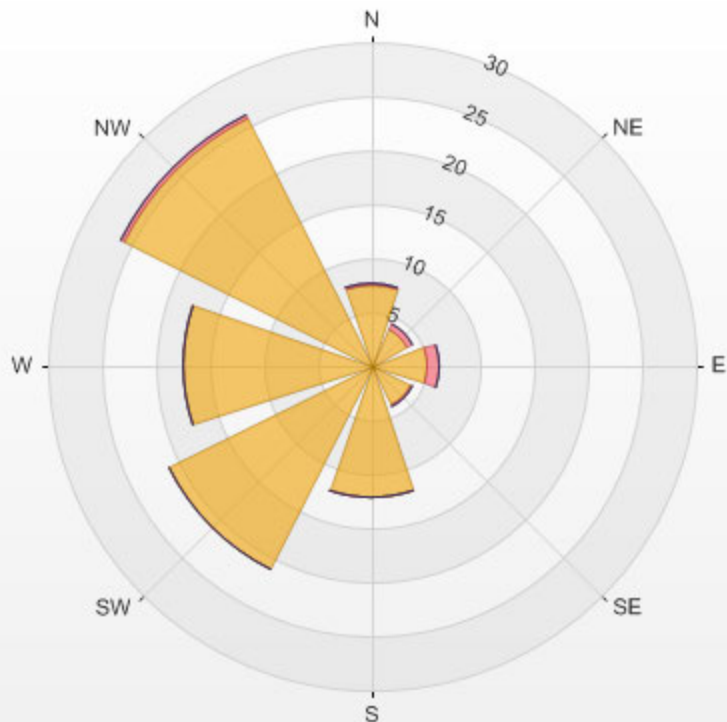
97 0.0-0.6

3 0.6-1.3

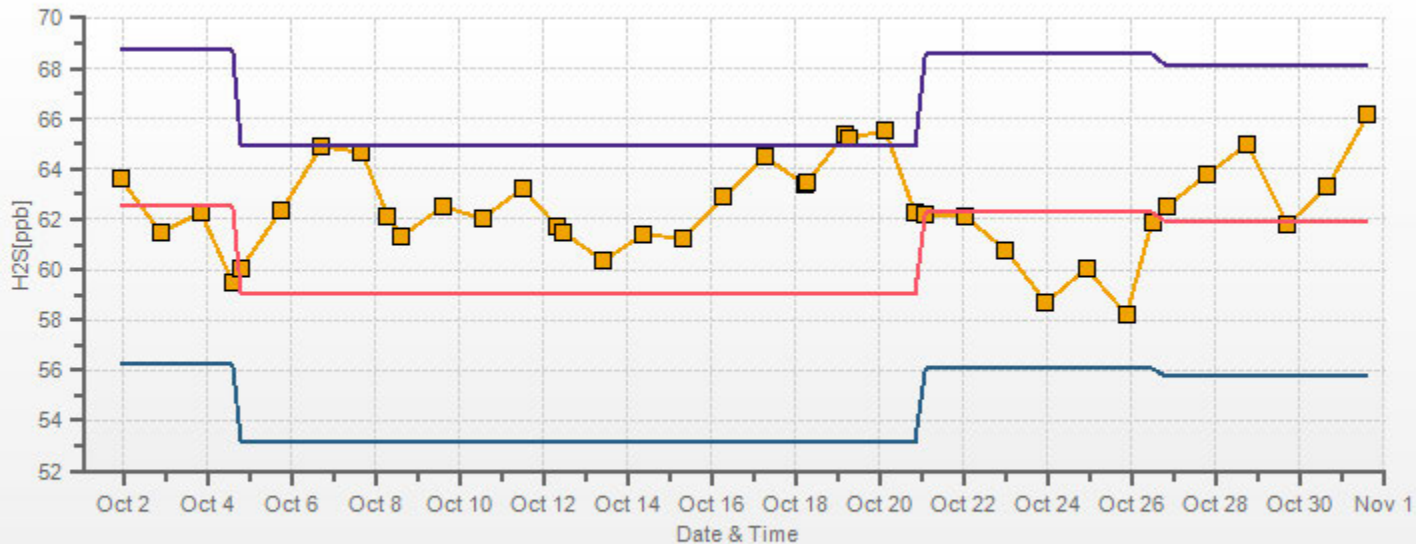
0 1.3-1.9

0 >1.9

LICA ST. LINA Poll.: LICA ST. LINA-H2S[ppb] 2017/10/01 00:00 - 2017/10/31 23:00 Calm: 0.58% Calm Poll Avg: 0.06[ppb]



H2S[ppb] Calibration: LICA ST. LINA Monthly: 17/10 Type: Span



Span Meas Span Ref Span Low Span High

TOTAL HYDROCARBON



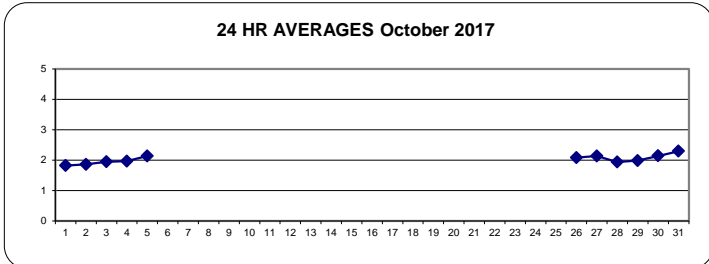
TOTAL HYDROCARBONS Hourly Averages (THC ppm)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.																						
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.																							
DAY																																																		
1	1.81	1.81	1.81	1.83	1.91	1.81	1.79	1.77	1.76	1.77	1.78	1.78	1.79	1.80	1.83	1.82	1.84	1.85	1.85	1.87	1.88	1.88	S	1.86	1.76	1.91	1.82	24																						
2	1.85	1.87	1.86	1.86	1.85	1.86	1.87	1.85	1.86	1.86	1.86	1.86	1.88	1.85	1.83	1.81	1.80	1.81	1.83	1.87	1.90	S	1.96	1.92	1.80	1.96	1.86	24																						
3	1.94	1.94	1.97	1.97	1.98	1.98	1.99	2.00	2.00	2.01	1.96	1.92	1.89	1.85	1.85	1.90	1.88	1.85	1.86	1.92	S	1.99	2.01	2.05	1.85	2.05	1.94	24																						
4	2.11	2.11	2.09	2.05	2.04	2.01	2.00	2.00	1.98	1.94	1.99	1.93	1.83	1.82	1.86	1.90	1.95	1.97	1.92	S	1.93	1.94	1.94	1.97	1.82	2.11	1.97	24																						
5	2.11	2.16	2.19	2.16	2.12	2.13	2.12	2.15	2.09	C	C	C	C	X	X	X	X	X	X	X	X	X	X	X	2.09	2.19	2.14	13																						
6	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	-																						
7	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	-																						
8	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	-																						
9	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	-																						
10	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	-																						
11	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	-																						
12	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	-																						
13	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	-																						
14	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	-																						
15	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	-																						
16	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	-																						
17	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	-																						
18	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	-																						
19	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	-																						
20	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	-																						
21	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	-																						
22	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	-																						
23	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	-																						
24	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	-																						
25	X	X	X	X	X	X	X	X	X	X	X	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	-	-	-	-																						
26	Y	Y	Y	Y	Y	Y	Y	Y	Y	C1	C1	C1	C1	2.08	2.10	2.10	2.08	2.08	2.06	2.06	S	2.06	2.08	2.10	2.06	2.10	2.08	11																						
27	2.12	2.17	2.16	2.19	2.25	2.26	2.24	2.20	2.16	2.21	2.18	2.17	2.08	2.06	2.07	2.10	2.09	2.08	2.08	S	2.05	2.06	2.06	2.07	2.05	2.26	2.14	24																						
28	2.04	2.02	2.02	2.04	2.07	1.98	1.88	1.91	1.88	1.86	1.86	1.91	1.91	1.90	1.92	1.95	1.96	1.95	S	1.92	1.90	1.88	1.88	1.93	1.86	2.07	1.94	24																						
29	1.92	1.92	1.89	1.87	1.86	1.93	1.93	1.94	1.90	1.97	2.03	2.00	1.99	1.96	1.95	1.96	1.97	S	2.02	2.09	2.12	2.14	2.15	2.17	1.86	2.17	1.99	24																						
30	2.15	2.18	2.17	2.19	2.20	2.17	2.14	2.13	2.11	2.14	2.14	2.13	2.13	2.12	2.09	2.08	S	2.11	2.13	2.13	2.13	2.16	2.15	2.18	2.08	2.20	2.14	24																						
31	2.17	2.18	2.22	2.23	2.22	2.22	2.21	2.16	2.13	2.13	2.12	2.06	2.05	2.25	3.00	S	2.66	2.69	2.54	2.45	2.36	2.29	2.26	2.24	2.05	3.00	2.30	24																						
HOURLY MAX	2.17	2.18	2.22	2.23	2.25	2.26	2.24	2.20	2.16	2.21	2.18	2.17	2.13	2.25	3.00	2.10	2.66	2.69	2.54	2.45	2.36	2.29	2.26	2.24																										
HOURLY AVG	2.02	2.04	2.04	2.04	2.05	2.04	2.02	2.01	1.99	1.99	1.99	1.97	1.95	1.97	2.05	1.96	2.03	2.04	2.03	2.04	2.03	2.04	2.05	2.05																										

STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

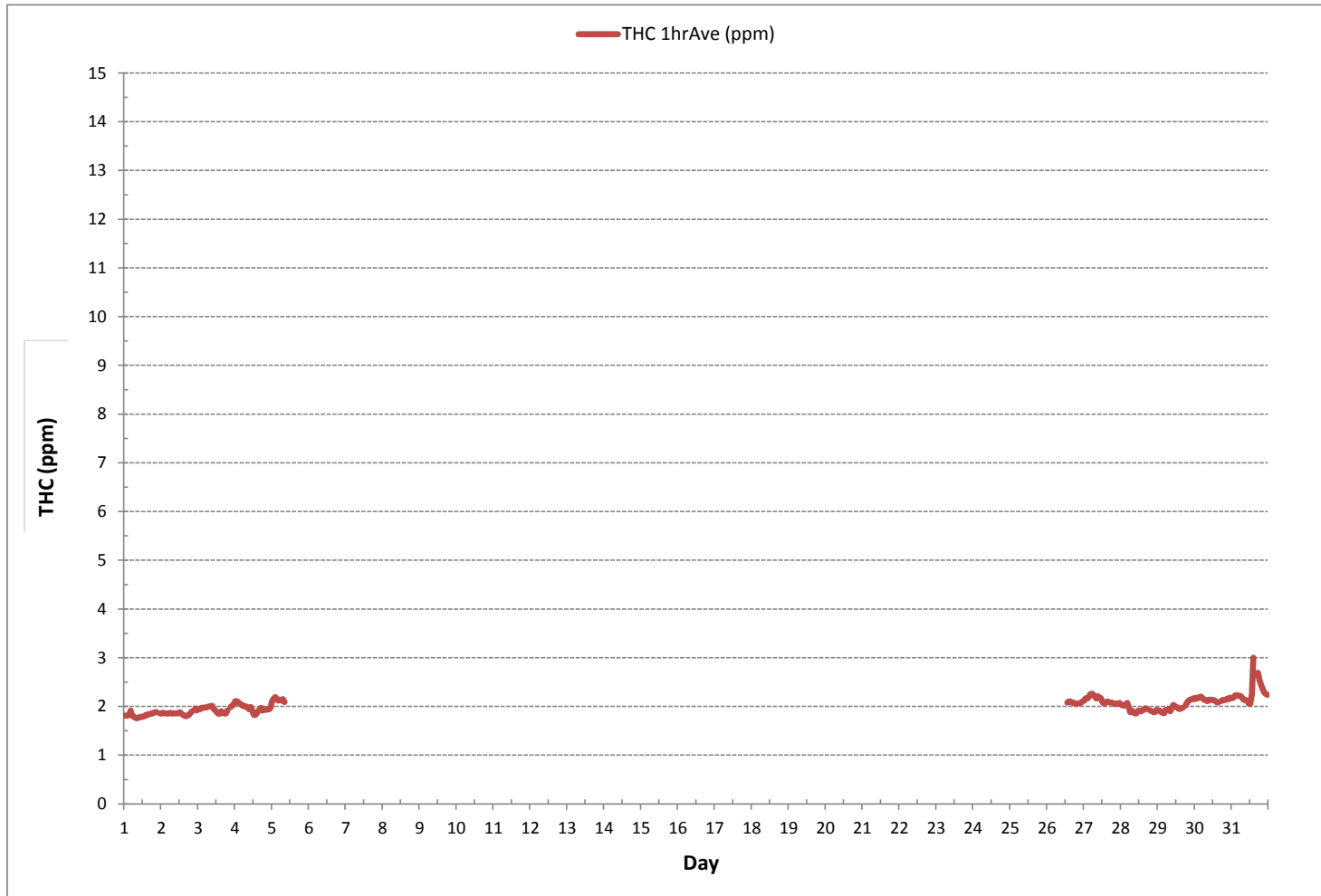
24 HR AVERAGES October 2017



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	226			
MINIMUM 1-HR AVERAGE:	1.76 ppm	@ HOUR	8	ON DAY 1
MAXIMUM 1-HR AVERAGE:	3.00 ppm	@ HOUR	14	ON DAY 31
MAXIMUM 24-HR AVERAGE:	2.30 ppm			ON DAY 31
IZS CALIBRATION TIME:	10 hrs	OPERATIONAL TIME:	240 hrs	
MONTHLY CALIBRATION TIME:	4 hrs	AMD OPERATION UPTIME:	32.3 %	
STANDARD DEVIATION:	0.17	MONTHLY AVERAGE:	2.02 ppm	

TOTAL HYDROCARBONS Hourly Averages (THC ppm)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
St. Lina Continuous Monitoring Station - October 2017

TOTAL HYDROCARBONS Instantaneous Maximum (THC ppm)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY MIN.	DAILY MAX.	24-HR AVG.	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59				
DAY 1	1.89	1.83	1.83	1.94	2.01	1.89	1.86	1.86	1.83	1.88	1.88	1.89	1.91	1.92	1.98	1.98	1.99	1.99	2.02	2.05	2.10	2.08	S	2.08	1.83	2.10	1.94	24
2	2.08	2.11	2.11	2.11	2.11	2.13	2.14	2.14	2.16	2.16	2.17	2.18	2.20	2.17	2.17	2.15	2.17	2.20	2.23	2.29	2.37	S	2.35	2.32	2.08	2.37	2.18	24
3	2.32	2.32	2.38	2.38	2.38	2.44	2.42	2.41	2.36	2.32	2.26	2.23	2.17	2.13	2.14	2.20	2.20	2.10	2.11	2.16	S	2.23	2.26	2.32	2.10	2.44	2.27	24
4	2.39	2.41	2.38	2.41	2.36	2.36	2.32	2.32	2.32	2.29	2.35	2.32	2.20	2.17	2.31	2.32	2.32	2.49	2.30	S	2.30	2.29	2.29	2.32	2.17	2.49	2.33	24
5	2.52	2.53	2.53	2.53	2.44	2.44	2.41	2.44	2.44	C	C	C	C	X	X	X	X	X	X	X	X	X	X	X	2.41	2.53	2.48	13
6	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	-
7	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	-
8	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	-
9	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	-
10	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	-
11	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	-
12	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	-
13	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	-
14	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	-
15	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	-
16	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	-
17	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	-
18	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	-
19	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	-
20	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	-
21	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	-
22	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	-
23	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	-
24	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	-
25	X	X	X	X	X	X	X	X	X	X	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	-	-	-	-
26	Y	Y	Y	Y	Y	Y	Y	Y	Y	C1	C1	C1	C1	2.07	2.10	2.11	2.11	2.11	2.11	2.14	S	2.11	2.16	2.14	2.07	2.16	2.12	11
27	2.14	2.20	2.17	2.19	2.23	2.20	2.20	2.11	2.16	2.14	2.10	2.04	1.95	1.96	2.01	1.94	1.92	1.92	S	1.88	1.89	1.87	1.87	1.87	1.87	2.23	2.06	24
28	1.86	1.83	1.81	1.83	1.85	1.82	1.69	1.68	1.66	1.65	1.64	1.72	1.67	1.72	1.72	1.74	1.73	1.74	S	1.77	1.78	1.79	1.83	1.91	1.64	1.91	1.76	24
29	1.86	1.91	1.93	1.96	1.98	1.97	1.97	1.99	1.96	2.01	2.04	2.01	2.01	2.01	2.04	2.11	2.10	S	2.14	2.16	2.20	2.20	2.20	2.20	1.86	2.20	2.04	24
30	2.19	2.20	2.20	2.20	2.22	2.19	2.17	2.13	2.11	2.11	2.11	2.10	2.10	2.08	2.02	2.01	S	2.01	2.02	2.02	1.99	2.04	2.00	2.01	1.99	2.22	2.10	24
31	2.01	1.98	2.02	2.02	2.01	1.98	1.95	1.95	1.86	1.87	1.82	1.78	1.78	2.44	2.75	S	2.47	2.41	2.29	2.14	2.07	1.95	1.92	1.91	1.78	2.75	2.06	24
HOURLY MAX	2.52	2.53	2.53	2.53	2.44	2.44	2.42	2.44	2.44	2.32	2.35	2.32	2.20	2.44	2.75	2.32	2.47	2.49	2.30	2.29	2.37	2.29	2.35	2.32				
HOURLY AVG	2.13	2.13	2.14	2.16	2.16	2.15	2.11	2.11	2.08	2.05	2.05	2.04	2.01	2.07	2.12	2.07	2.11	2.11	2.13	2.09	2.09	2.06	2.10	2.11				

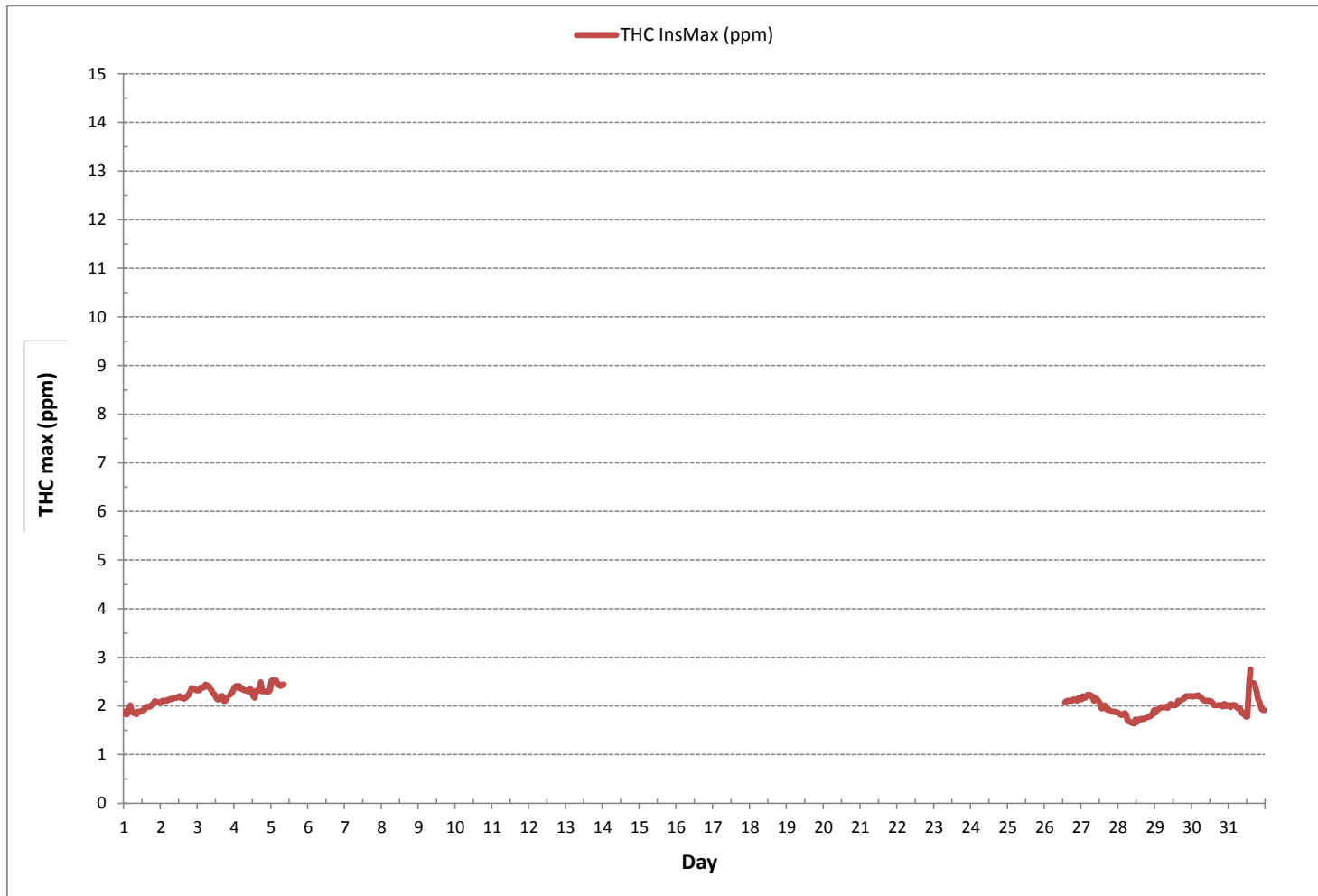
STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	226
MAXIMUM INSTANTANEOUS VALUE:	2.75 ppm @ HOUR 14 ON DAY 31
IZS CALIBRATION TIME:	10 hrs
MONTHLY CALIBRATION TIME:	4 hrs
OPERATIONAL TIME:	240 hrs
STANDARD DEVIATION:	0.21

TOTAL HYDROCARBONS Instantaneous Maximum (THC ppm)



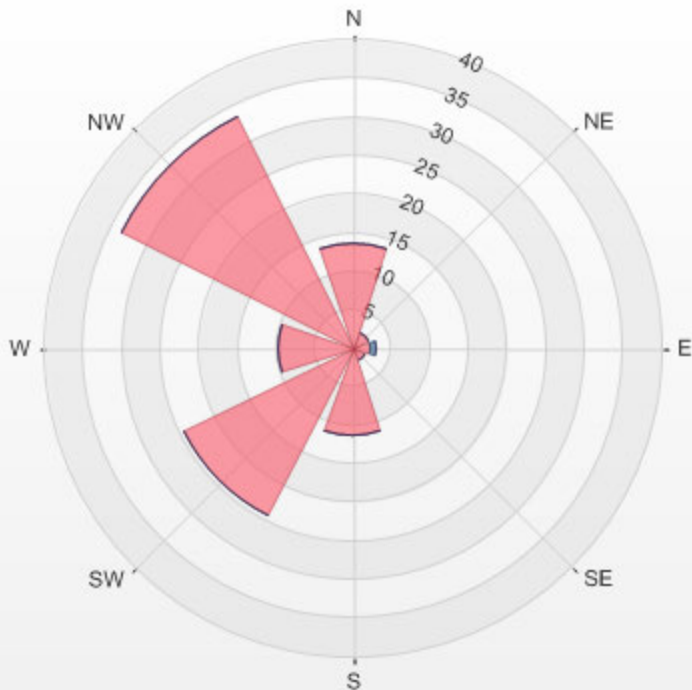
Wind: LICA ST. LINA
Poll.: LICA ST. LINA-THC[ppm]
Monthly: 17/10
Type: PollutionRose
Direction: Blowing From (Wind Frequency)
Based On 1 Hr.

Calm: 0.00% Calm Avg: 0.00 [ppm]

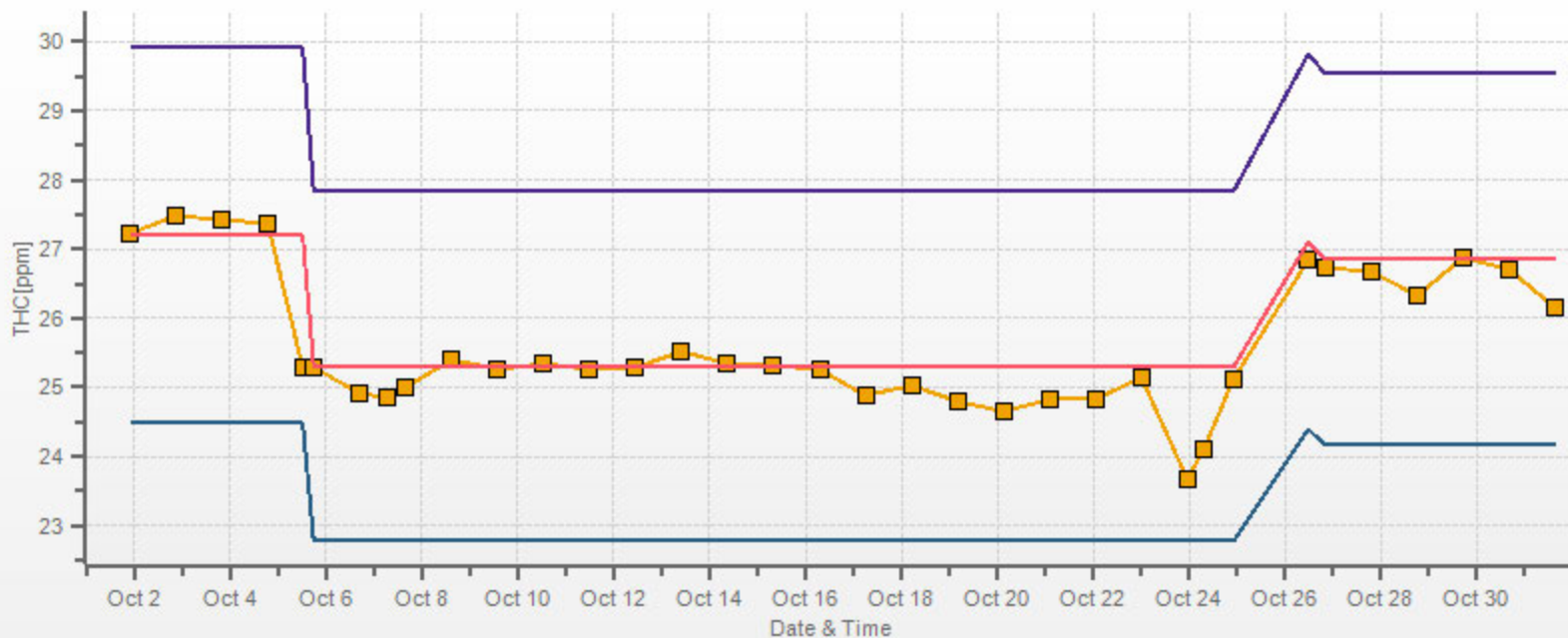
Direction	0.0-1.3	1.3-2.7	2.7-4.0	>4.0	Total
N	0.0	13.7	0.0	0.0	13.7
NE	0.0	2.2	0.0	0.0	2.2
E	0.0	2.2	0.9	0.0	3.1
SE	0.0	1.8	0.0	0.0	1.8
S	0.0	11.5	0.0	0.0	11.5
SW	0.0	24.3	0.0	0.0	24.3
W	0.0	9.7	0.0	0.0	9.7
NW	0.0	33.6	0.0	0.0	33.6
Summary	0.0	99.1	0.9	0.0	100.0

% Icon Classes (ppm) 0 0.0-1.3 99 1.3-2.7 1 2.7-4.0 0 >4.0

LICA ST. LINA Poll.: LICA ST. LINA-THC[ppm] 2017/10/01 00:00 - 2017/10/31 23:00 Calm: 0.00%



THC[ppm] Calibration: LICA ST. LINA Monthly: 17/10 Type: Span



■ Span Meas
 — Span Ref
 — Span Low
 — Span High

OXIDES OF NITROGEN



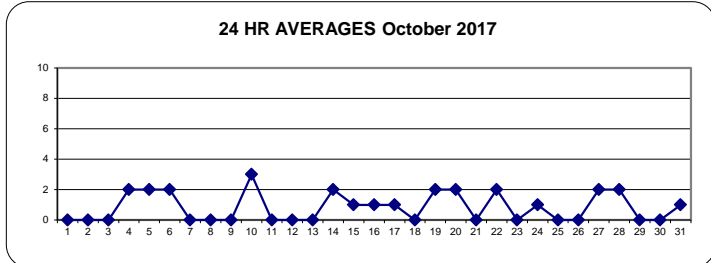
OXIDES OF NITROGEN Hourly Averages (NO_x ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.																						
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.																							
DAY																																																		
1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	1	0	24																					
2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	24																					
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	S	3	3	4	0	0	4	0	24																					
4	4	4	4	2	1	1	1	1	1	1	0	C	C	C	C	C	C	C	0	S	1	1	1	1	0	0	4	2	24																					
5	1	2	2	1	2	2	2	3	3	3	4	2	1	1	1	0	1	1	S	2	2	1	1	1	0	0	4	2	24																					
6	1	1	1	1	1	2	3	4	3	4	3	3	3	3	2	4	5	S	3	0	0	0	0	0	0	0	5	2	24																					
7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	24																					
8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	24																					
9	0	0	0	0	0	0	0	0	1	2	2	2	1	0	S	0	0	0	0	0	0	0	0	0	0	0	2	0	24																					
10	0	0	1	1	0	1	1	1	1	1	1	0	0	0	S	12	12	8	9	5	3	3	2	2	1	0	0	12	3	24																				
11	1	1	0	0	1	0	1	1	1	1	1	1	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24																				
12	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24																					
13	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	24																					
14	1	1	0	1	1	1	1	1	2	S	4	6	7	7	3	2	1	0	0	0	0	0	0	0	0	0	7	2	24																					
15	0	0	0	0	0	0	0	0	S	3	2	1	1	0	0	0	0	1	0	1	1	1	1	1	0	0	3	1	24																					
16	1	2	2	1	0	0	0	S	0	0	0	0	0	0	0	0	1	0	0	1	1	1	1	2	0	0	2	1	24																					
17	2	1	1	1	2	2	S	3	3	2	2	2	2	2	2	3	3	1	0	0	0	0	0	0	0	0	3	1	24																					
18	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	2	2	1	0	0	2	0	24																					
19	1	1	1	1	S	1	1	1	2	4	3	1	1	1	1	1	0	2	4	4	4	4	4	3	0	0	4	2	24																					
20	3	2	2	S	2	2	3	5	5	5	4	4	3	4	3	3	2	1	1	0	0	0	0	0	0	0	5	2	24																					
21	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	0	0	1	0	24																					
22	1	S	3	4	3	4	3	3	3	4	3	3	3	3	3	2	1	1	1	1	0	0	0	0	0	0	4	2	24																					
23	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	3	3	2	S	0	0	3	0	24																					
24	2	1	1	1	1	2	3	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	3	1	24																					
25	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	S	1	0	0	0	1	0	24																					
26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	1	2	0	0	2	0	24																					
27	2	2	2	2	2	2	2	3	S1	3	3	2	0	0	0	0	0	0	0	S	1	2	4	S1	0	0	4	2	22																					
28	5	5	6	6	5	3	1	1	1	1	0	0	0	0	0	0	0	0	S	S1	S1	0	0	0	0	0	6	2	22																					
29	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	24																					
30	0	0	0	0	0	0	0	S1	S1	0	1	1	0	0	0	1	S	1	1	1	1	1	1	1	0	0	1	0	22																					
31	2	2	2	3	3	S1	S1	0	0	0	0	0	0	0	0	S	0	0	0	2	3	S1	3	3	0	0	3	1	21																					
HOURLY MAX	5	5	6	6	5	4	3	5	5	5	4	6	7	7	12	12	8	9	5	4	4	4	4	4	4																									
HOURLY AVG	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1																									

STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

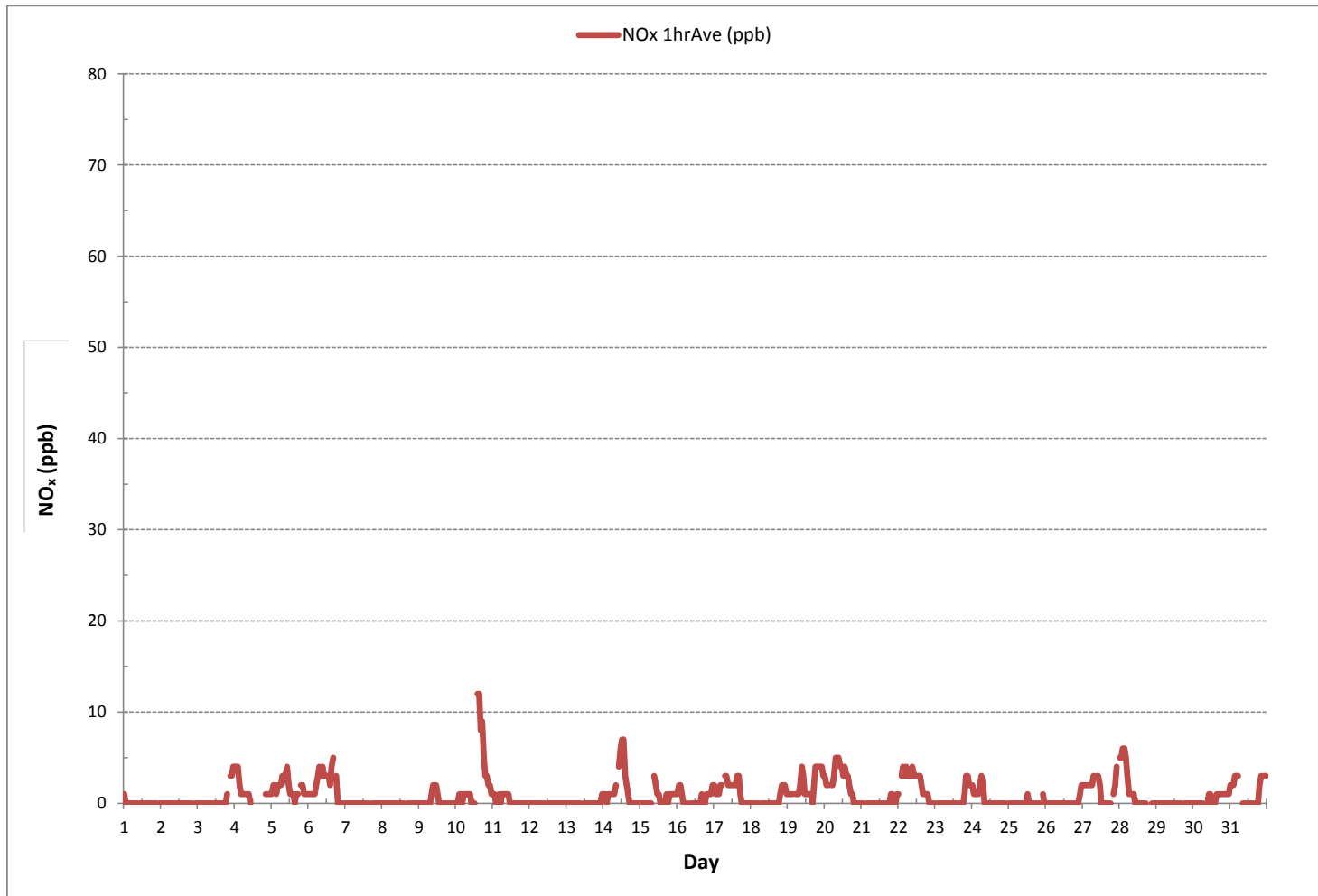
24 HR AVERAGES October 2017



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	269			
MINIMUM 1-HR AVERAGE:	0 ppb	@ HOUR	1	ON DAY 1
MAXIMUM 1-HR AVERAGE:	12 ppb	@ HOUR	14	ON DAY 10
MAXIMUM 24-HR AVERAGE:	3 ppb			ON DAY 10
IZS CALIBRATION TIME:	32 hrs	OPERATIONAL TIME:	735 hrs	
MONTHLY CALIBRATION TIME:	7 hrs	AMD OPERATION UPTIME:	98.8 %	
STANDARD DEVIATION:	1	MONTHLY AVERAGE:	1 ppb	

OXIDES OF NITROGEN Hourly Averages (NO_x ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
St. Lina Continuous Monitoring Station - October 2017

OXIDES OF NITROGEN Instantaneous Maximum (NO_x ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY																													
1	2	1	1	2	2	2	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	S	1	0	2	1	24	
2	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	S	1	1	1	2	1	24
3	1	1	1	1	1	1	2	4	3	2	2	1	1	1	7	3	2	2	2	2	2	S	4	5	6	1	7	2	24
4	6	6	6	4	3	3	4	3	3	2	2	C	C	C	C	C	C	C	2	S	2	3	2	4	2	6	3	24	
5	5	31	30	4	31	6	21	37	4	4	37	5	3	12	3	3	8	11	S	3	3	16	2	2	2	37	12	24	
6	2	2	2	2	2	5	31	41	6	5	5	9	5	31	6	7	8	S	6	4	2	1	1	1	1	41	8	24	
7	1	1	1	0	0	1	0	1	1	1	1	1	0	0	0	1	S	1	0	1	0	0	0	0	0	1	1	24	
8	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	S	1	1	0	0	0	2	1	0	0	2	0	24	
9	0	1	1	1	1	0	1	1	3	3	3	3	2	1	S	2	17	2	1	1	1	1	1	1	0	17	2	24	
10	1	1	2	1	1	3	23	6	4	1	1	1	1	S	15	15	10	10	8	4	4	3	3	3	1	23	5	24	
11	2	2	1	1	2	2	2	2	2	4	6	3	S	4	1	5	2	1	0	1	1	0	0	1	0	6	2	24	
12	1	1	1	1	1	1	1	2	2	1	13	S	3	0	2	4	4	3	1	1	1	0	0	0	0	13	2	24	
13	0	0	0	1	1	2	2	2	0	3	S	2	1	0	1	1	0	0	1	1	2	2	2	3	0	3	1	24	
14	2	2	2	2	2	2	2	2	S	5	6	23	8	7	3	2	2	1	19	1	1	1	1	1	1	23	4	24	
15	1	1	1	1	15	1	1	3	S	5	3	3	2	22	1	1	1	2	2	19	14	3	2	2	1	22	5	24	
16	2	3	3	2	2	1	1	S	2	2	1	1	1	1	1	28	4	2	2	3	2	2	3	3	1	28	3	24	
17	3	2	2	2	3	4	S	5	5	4	4	3	3	3	5	6	3	1	1	1	0	0	0	0	6	3	24		
18	0	0	0	0	0	S	1	1	1	1	0	0	0	1	2	1	1	1	1	2	3	2	3	2	0	3	1	24	
19	2	2	2	2	S	3	2	3	4	5	4	3	3	2	2	3	1	4	5	5	6	5	5	4	1	6	3	24	
20	4	3	2	S	3	3	5	7	6	6	6	37	20	6	4	4	3	2	3	2	1	1	1	1	1	37	6	24	
21	1	1	S	2	1	1	1	1	1	1	1	3	3	1	2	3	4	4	1	2	2	1	1	1	1	4	2	24	
22	1	S	4	4	4	4	4	4	4	7	4	4	4	4	4	3	2	2	2	2	2	1	1	1	1	7	3	24	
23	S	1	1	1	1	1	1	1	1	1	2	1	2	1	11	1	1	1	1	4	13	4	3	S	1	13	2	24	
24	3	2	2	2	2	3	4	3	2	1	1	1	0	0	0	1	2	1	2	1	1	1	S	1	0	4	2	24	
25	1	1	1	1	1	1	1	1	1	2	1	1	2	3	1	14	0	1	1	2	1	1	S	2	1	0	14	2	24
26	1	1	0	0	0	1	3	3	2	3	2	1	1	1	2	2	2	18	3	S	3	3	3	5	0	18	3	24	
27	3	4	3	3	4	4	4	5	S1	S1	36	6	3	2	2	3	4	6	5	S	4	4	5	S1	2	36	6	21	
28	5	7	7	7	6	5	2	2	1	2	1	2	1	1	1	0	1	0	S	S1	S1	1	0	0	0	7	2	22	
29	0	0	0	0	0	0	0	0	0	0	23	1	1	1	1	0	1	S	0	0	0	1	0	1	0	23	1	24	
30	0	0	0	0	1	1	3	S1	S1	2	3	4	3	5	5	5	S	5	4	4	4	4	3	4	0	5	3	22	
31	3	4	4	4	4	4	S1	S1	5	4	4	4	4	8	12	S	9	7	6	5	4	S1	5	4	3	12	5	21	
HOURLY MAX	6	31	30	7	31	6	31	41	6	7	37	37	20	31	15	28	17	11	18	19	14	16	5	6					
HOURLY AVG	2	3	3	2	3	2	4	5	2	2	6	4	3	4	4	4	4	3	3	3	3	2	2	2					

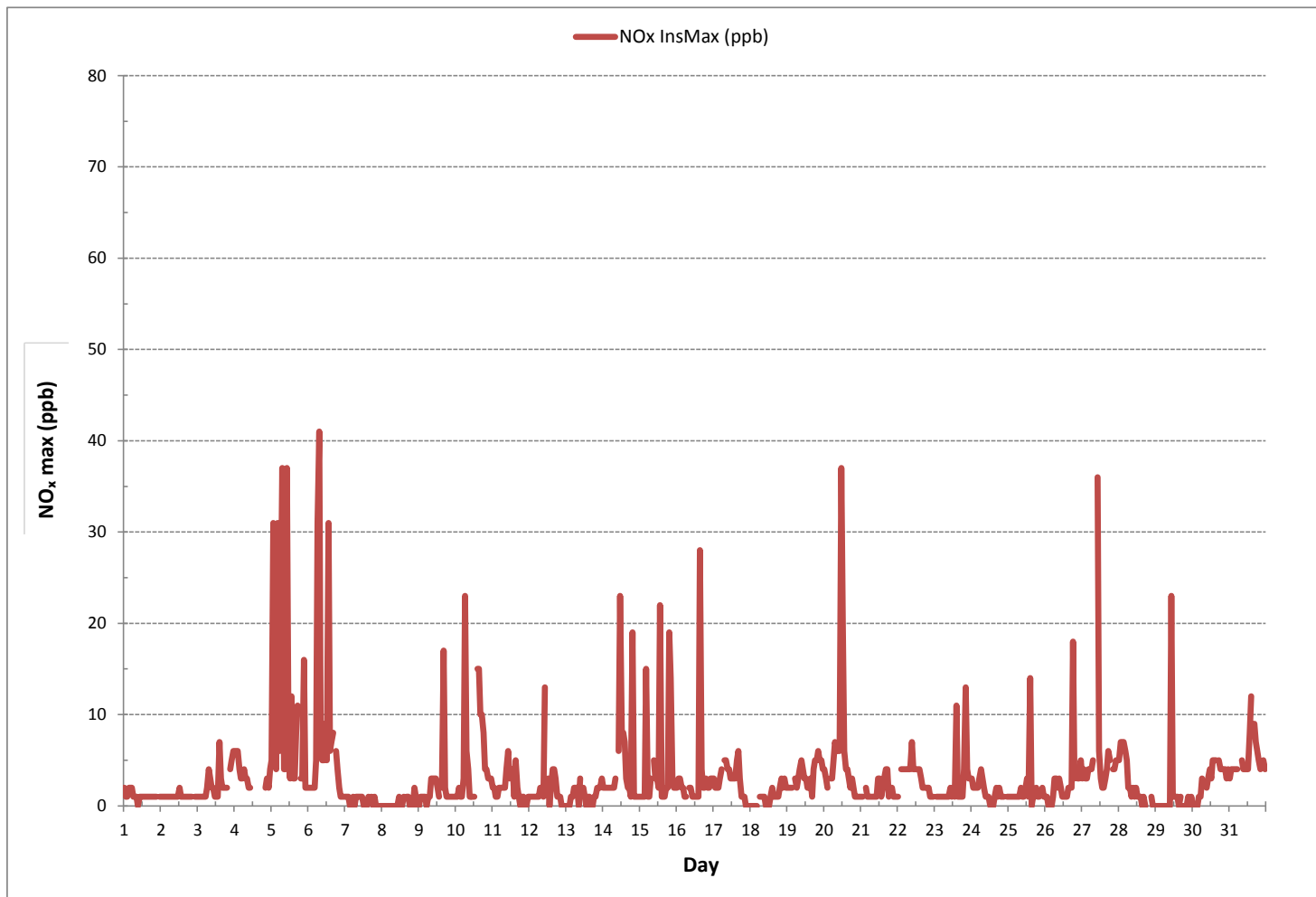
STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	609
MAXIMUM INSTANTANEOUS VALUE:	41 ppb @ HOUR 7 ON DAY 6
IZS CALIBRATION TIME:	32 hrs
MONTHLY CALIBRATION TIME:	7 hrs
OPERATIONAL TIME:	734 hrs
STANDARD DEVIATION:	5

OXIDES OF NITROGEN Instantaneous Maximum (NO_x ppb)



% Icon Classes (ppb)

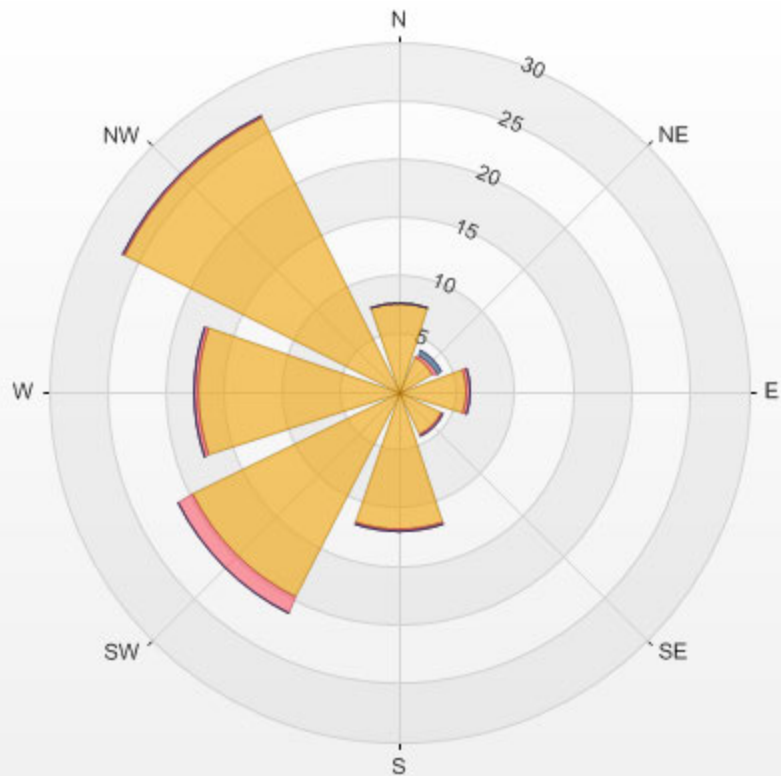
96 0.0-4.3

3 4.3-8.7

0 8.7-13.0

0 >13.0

LICA ST. LINA Poll.: LICA ST. LINA-NOX[ppb] 2017/10/01 00:00 - 2017/10/31 23:00 Calm: 0.58% Calm Poll Avg: 0.25[ppb]



NOX[ppb] Calibration: LICA ST. LINA Monthly: 17/10 Type: Span



Span Meas Span Ref Span Low Span High

NITRIC OXIDES



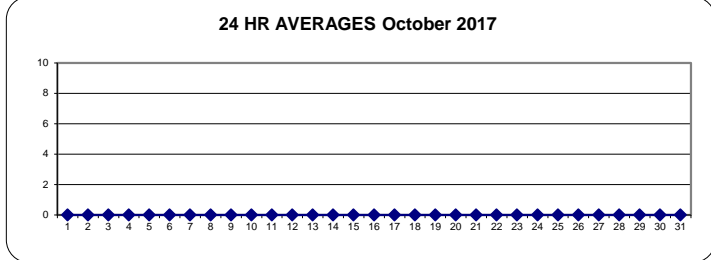
NITRIC OXIDE Hourly Averages (NO ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY MIN.	DAILY MAX.	24-HR AVG.	RDGS.				
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59								
DAY																																
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	24				
2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	24				
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	24				
4	0	0	0	0	0	0	0	0	0	0	0	0	C	C	C	C	C	C	C	S	0	0	0	0	0	0	0	24				
5	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	1	24				
6	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	1	0	24				
7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	24				
8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	24				
9	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	24				
10	0	0	0	0	0	0	0	0	0	0	0	0	S	2	1	0	0	0	0	0	0	0	0	0	0	2	0	24				
11	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24				
12	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24				
13	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24				
14	0	0	0	0	0	0	0	0	0	S	1	3	3	2	0	0	0	0	0	0	0	0	0	0	0	3	0	24				
15	0	0	0	0	0	0	0	0	S	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24				
16	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24				
17	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24				
18	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24				
19	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24				
20	0	0	0	S	0	0	0	0	0	1	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	24				
21	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24				
22	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24				
23	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	24				
24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	24				
25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	24				
26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	24				
27	0	0	0	0	0	0	0	0	S1	2	1	1	0	0	0	0	0	0	S	0	0	0	S1	0	0	2	0	22				
28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	S1	S1	0	0	0	0	0	0	22				
29	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24				
30	0	0	0	0	0	0	0	S1	S1	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	22				
31	0	0	0	0	0	S1	S1	0	0	0	0	0	0	S	0	0	0	0	0	0	0	S1	0	0	0	0	0	21				
HOURLY MAX	0	0	0	0	0	0	0	1	0	2	1	3	3	2	2	1	0	0	0	0	0	0	0	0								
HOURLY AVG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0								

STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

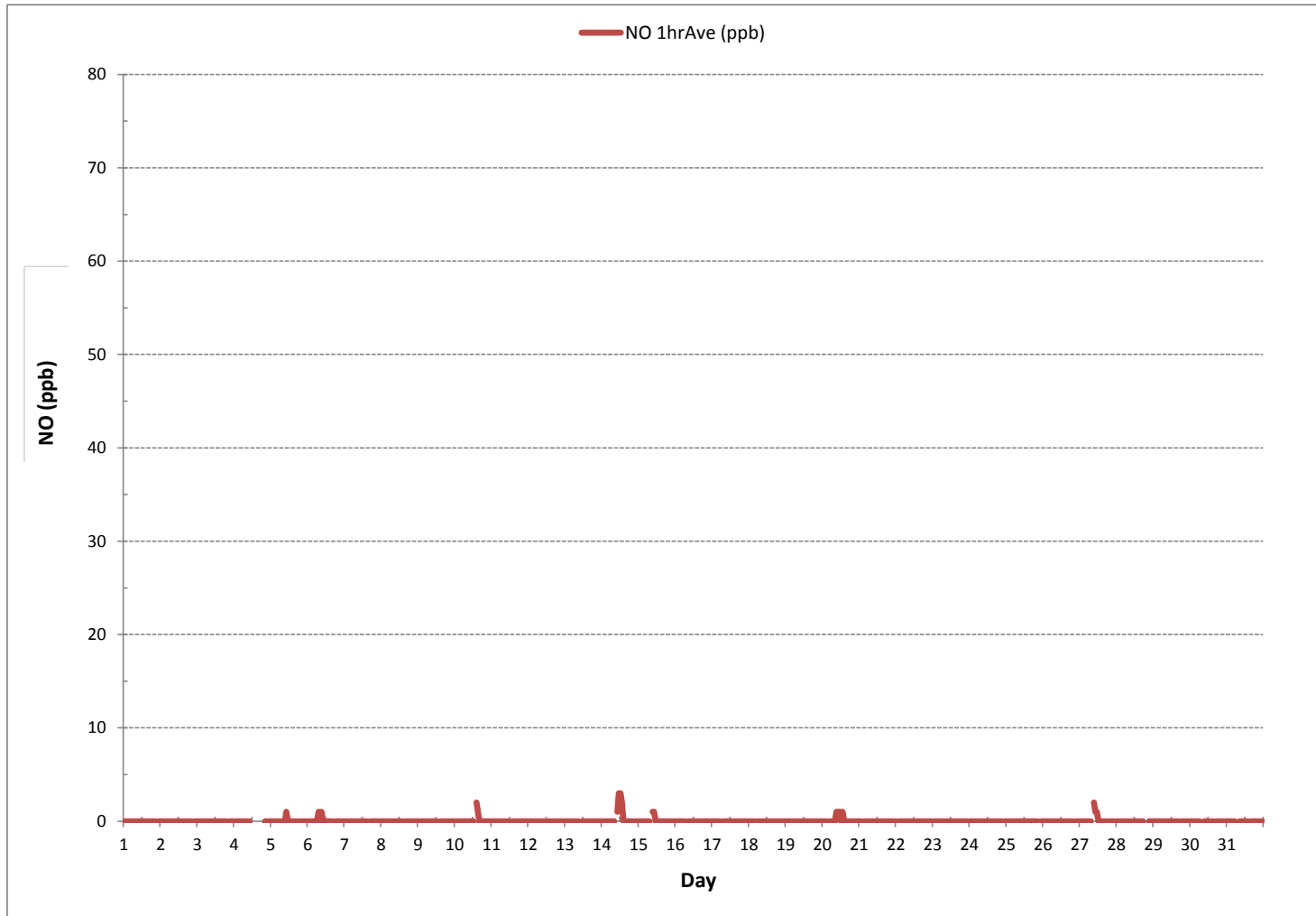
24 HR AVERAGES October 2017



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	18			
MINIMUM 1-HR AVERAGE:	0	ppb @ HOUR	0	ON DAY 1
MAXIMUM 1-HR AVERAGE:	3	ppb @ HOUR	14	ON DAY 14
MAXIMUM 24-HR AVERAGE:	0	ppb		ON DAY 1
IZS CALIBRATION TIME:	32	hrs	OPERATIONAL TIME:	735 hrs
MONTHLY CALIBRATION TIME:	7	hrs	AMD OPERATION UPTIME:	98.8 %
STANDARD DEVIATION:	0		MONTHLY AVERAGE:	0 ppb

NITRIC OXIDE Hourly Averages (NO ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
St. Lina Continuous Monitoring Station - October 2017

NITRIC OXIDE Instantaneous Maximum (NO ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.					
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.						
DAY																																	
1	2	1	1	1	2	2	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	S	2	1	2	1	24					
2	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	2	1	1	1	1	1	2	S	2	2	1	2	1	24				
3	2	1	1	1	1	2	2	3	3	2	2	2	1	1	2	2	2	2	1	1	S	1	1	2	1	3	2	24					
4	1	2	1	2	1	2	2	2	2	2	1	C	C	C	C	C	C	C	2	S	3	3	2	2	1	3	2	24					
5	4	21	33	4	22	5	20	25	3	3	29	4	3	9	3	3	4	9	S	3	3	10	2	2	2	33	10	24					
6	2	2	2	2	2	3	20	34	5	4	3	6	3	23	4	4	3	S	3	3	3	2	2	2	2	34	6	24					
7	2	2	2	2	2	2	3	2	3	2	2	2	2	2	2	3	S	2	2	2	2	2	2	2	2	3	2	24					
8	2	2	2	2	2	2	2	2	2	2	2	3	2	2	2	S	3	2	2	2	2	2	2	2	2	3	2	24					
9	2	2	2	2	2	2	2	2	3	3	3	3	3	3	S	3	13	3	2	2	2	2	2	2	2	13	3	24					
10	2	2	2	2	2	3	18	4	3	2	2	2	S	5	5	3	3	2	2	2	2	2	2	2	2	18	3	24					
11	2	2	2	2	2	2	2	2	2	3	5	4	S	4	2	5	3	2	2	2	2	2	2	2	2	5	3	24					
12	2	2	2	2	2	3	2	3	3	3	13	S	4	3	4	4	5	4	3	3	3	3	2	3	2	13	3	24					
13	2	2	3	2	2	3	2	3	3	3	S	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	24					
14	3	2	2	3	3	3	2	3	S	5	17	6	6	4	3	2	2	3	12	2	3	3	3	3	2	17	4	24					
15	3	2	3	3	8	2	3	4	S	4	4	3	3	14	2	2	2	2	2	14	11	3	3	2	2	14	4	24					
16	2	2	2	2	2	2	2	S	3	3	2	2	2	3	2	16	3	2	2	2	2	2	2	2	2	16	3	24					
17	2	2	3	2	2	3	S	3	3	3	3	3	3	3	3	3	3	3	2	2	3	3	2	2	2	3	3	24					
18	3	3	2	2	3	S	3	3	3	3	3	2	2	3	3	3	2	2	2	2	2	2	2	2	2	3	2	24					
19	2	2	2	2	S	3	2	3	3	4	4	4	3	3	2	2	2	2	2	2	2	2	2	2	2	4	2	24					
20	3	2	2	S	3	3	2	3	4	4	4	33	17	4	3	3	3	2	3	2	3	2	2	2	2	33	5	24					
21	2	2	S	3	3	3	3	2	3	3	3	5	5	3	4	3	3	3	3	2	2	2	2	2	2	5	3	24					
22	2	S	3	2	3	3	3	3	3	5	3	3	3	4	3	3	3	3	2	3	3	2	2	2	2	5	3	24					
23	S	2	2	2	2	3	3	2	2	2	3	2	3	3	9	3	2	3	3	3	7	2	2	S	2	9	3	24					
24	2	2	2	2	2	2	2	3	2	2	4	3	3	2	3	3	3	2	3	3	2	3	S	3	2	4	3	24					
25	3	2	2	2	2	3	3	2	3	2	2	2	3	3	18	2	2	2	2	3	2	2	S	3	2	18	3	24					
26	2	2	2	2	2	3	3	4	3	3	3	3	3	3	3	3	3	2	18	4	S	3	3	4	2	18	4	24					
27	2	3	2	2	2	3	3	4	S1	S1	29	5	3	3	3	3	4	3	S	2	2	2	S1	2	29	4	21						
28	3	4	2	2	2	2	2	2	2	3	3	3	3	3	2	2	2	2	S	S1	S1	2	2	2	2	4	2	22					
29	2	2	2	2	2	2	2	2	2	2	15	3	3	3	3	3	3	S	2	2	2	3	2	3	2	15	3	24					
30	3	3	2	3	2	3	4	S1	S1	3	4	4	3	4	3	4	S	3	3	2	3	3	3	3	2	4	3	22					
31	3	3	3	3	3	3	S1	S1	3	3	3	3	3	3	5	S	3	3	3	3	3	3	S1	3	3	5	3	22					
HOURLY MAX	4	21	33	4	22	5	20	34	5	5	29	33	17	23	18	16	13	9	18	14	11	10	3	4									
HOURLY AVG	2	3	3	2	3	3	4	5	3	3	5	4	3	4	4	3	3	3	3	3	3	3	2	2									

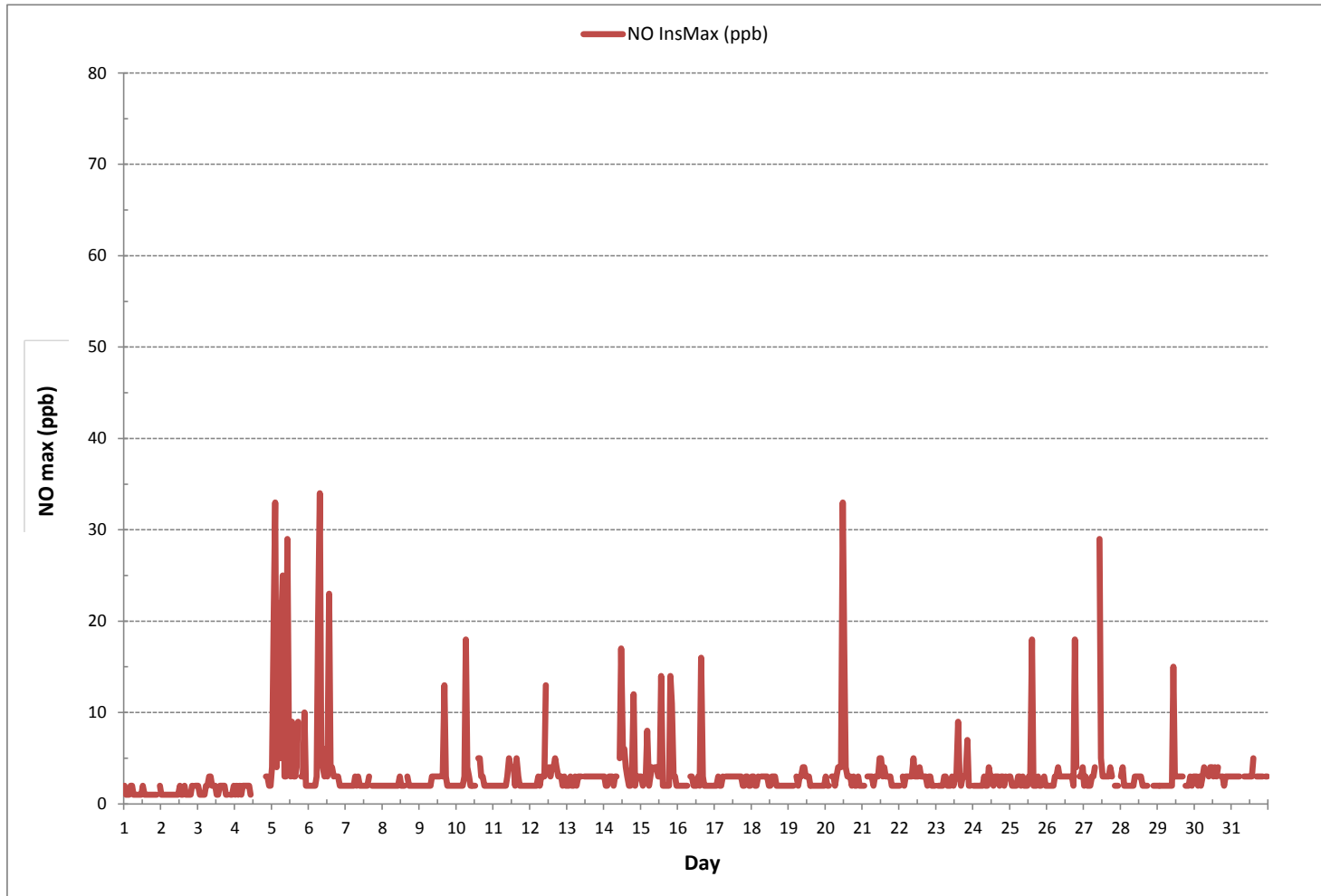
STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	695
MAXIMUM INSTANTANEOUS VALUE:	34 ppb @ HOUR 7 ON DAY 6
IZS CALIBRATION TIME:	32 hrs
MONTHLY CALIBRATION TIME:	7 hrs
STANDARD DEVIATION:	4
OPERATIONAL TIME:	734 hrs

NITRIC OXIDE Instantaneous Maximum (NO ppb)



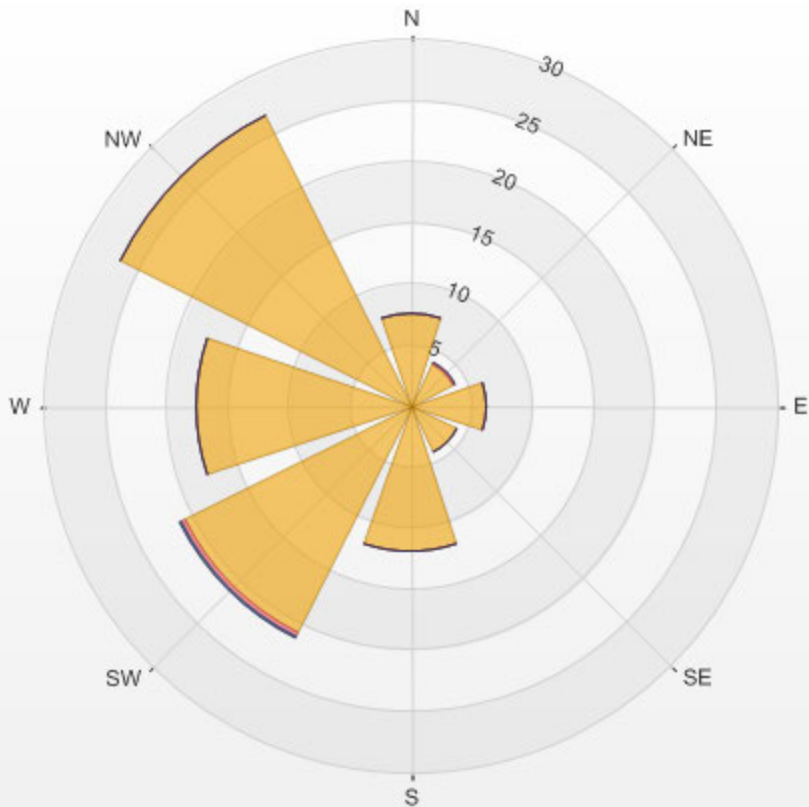
Wind: LICA ST. LINA
 Poll.: LICA ST. LINA-NO[ppb]
 Monthly: 17/10
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 0.58% Calm Avg: 0.00 [ppb]

Direction	0.0-1.3	1.3-2.7	2.7-4.0	>4.0	Total
N	7.6	0.0	0.0	0.0	7.6
NE	3.9	0.1	0.0	0.0	4.0
E	6.2	0.0	0.0	0.0	6.2
SE	4.3	0.0	0.0	0.0	4.3
S	12.0	0.0	0.0	0.0	12.0
SW	20.8	0.3	0.1	0.0	21.2
W	17.6	0.0	0.0	0.0	17.6
NW	26.5	0.0	0.0	0.0	26.5
Summary	98.9	0.4	0.1	0.0	99.4

% Icon Classes (ppb) 99 0.0-1.3 0 1.3-2.7 0 2.7-4.0 0 >4.0

LICA ST. LINA Poll.: LICA ST. LINA-NO[ppb] 2017/10/01 00:00 - 2017/10/31 23:00 Calm: 0.58% Calm Poll Avg: 0.00[ppb]



NITROGEN DIOXIDE

NITROGEN DIOXIDE Hourly Averages (NO₂ ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY																													
1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	1	0	24
2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	24
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	S	3	3	4	0	4	0	24	
4	4	4	4	2	1	1	1	1	1	1	0	C	C	C	C	C	C	C	0	S	1	1	1	1	0	4	2	24	
5	1	2	2	1	2	2	2	3	3	2	4	2	1	1	1	0	1	1	S	2	2	1	1	1	0	4	2	24	
6	1	1	1	1	1	2	3	3	3	3	3	3	3	2	2	4	5	S	3	0	0	0	0	0	0	5	2	24	
7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	24	
8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	24	
9	0	0	0	0	0	0	0	0	1	2	2	2	1	0	S	0	0	0	0	0	0	0	0	0	0	2	0	24	
10	0	0	1	1	0	1	1	1	1	1	1	0	0	S	10	11	8	9	5	3	3	2	2	1	0	11	3	24	
11	1	1	0	0	1	0	1	1	1	1	1	1	0	S	0	0	0	0	0	0	0	0	0	0	0	1	0	24	
12	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24	
13	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	24	
14	1	1	0	1	1	1	1	1	2	S	3	4	4	4	2	2	1	0	0	0	0	0	0	0	0	4	1	24	
15	0	0	0	0	0	0	0	0	S	2	2	1	1	0	0	0	0	1	0	1	1	1	1	1	0	2	1	24	
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17	2	1	1	1	2	2	S	3	3	2	2	2	2	2	2	3	3	1	0	0	0	0	0	0	0	3	1	24	
18	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	2	2	1	0	2	0	24	
19	1	1	1	1	S	1	1	1	2	3	2	1	1	1	1	1	0	2	4	4	4	4	3	0	4	2	24		
20	3	2	2	S	2	2	3	5	5	4	3	3	3	4	3	3	2	1	1	0	0	0	0	0	5	2	24		
21	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	0	1	0	24	
22	1	S	3	4	3	4	3	3	3	3	3	3	3	3	3	2	1	1	1	1	0	0	0	0	4	2	24		
23	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	3	3	2	S	0	3	0	24	
24	2	1	1	1	1	2	3	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	3	1	24	
25	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	S	1	0	0	1	0	24	
26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	1	2	0	2	0	24	
27	2	2	2	2	2	2	2	3	S1	2	1	1	0	0	0	0	0	0	0	S	1	2	4	S1	0	4	1	22	
28	5	5	6	6	5	3	1	1	1	1	0	0	0	0	0	0	0	0	S	S1	S1	0	0	0	0	6	2	22	
29	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	24	
30	0	0	0	0	0	0	0	S1	S1	0	1	1	0	0	0	0	S	1	1	1	1	1	1	1	0	1	0	22	
31	2	2	2	3	3	3	S1	S1	0	0	0	0	0	0	0	S	0	0	0	2	3	S1	3	3	0	3	1	21	
HOURLY MAX	5	5	6	6	5	4	3	5	5	4	4	4	4	4	10	11	8	9	5	4	4	4	4	4					
HOURLY AVG	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1					

STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

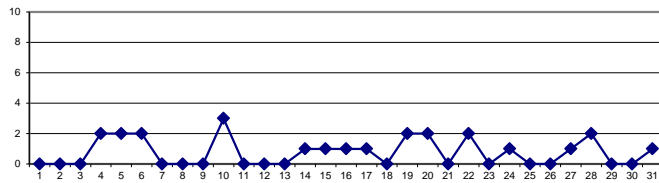
OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT: 1-HR 159 ppb

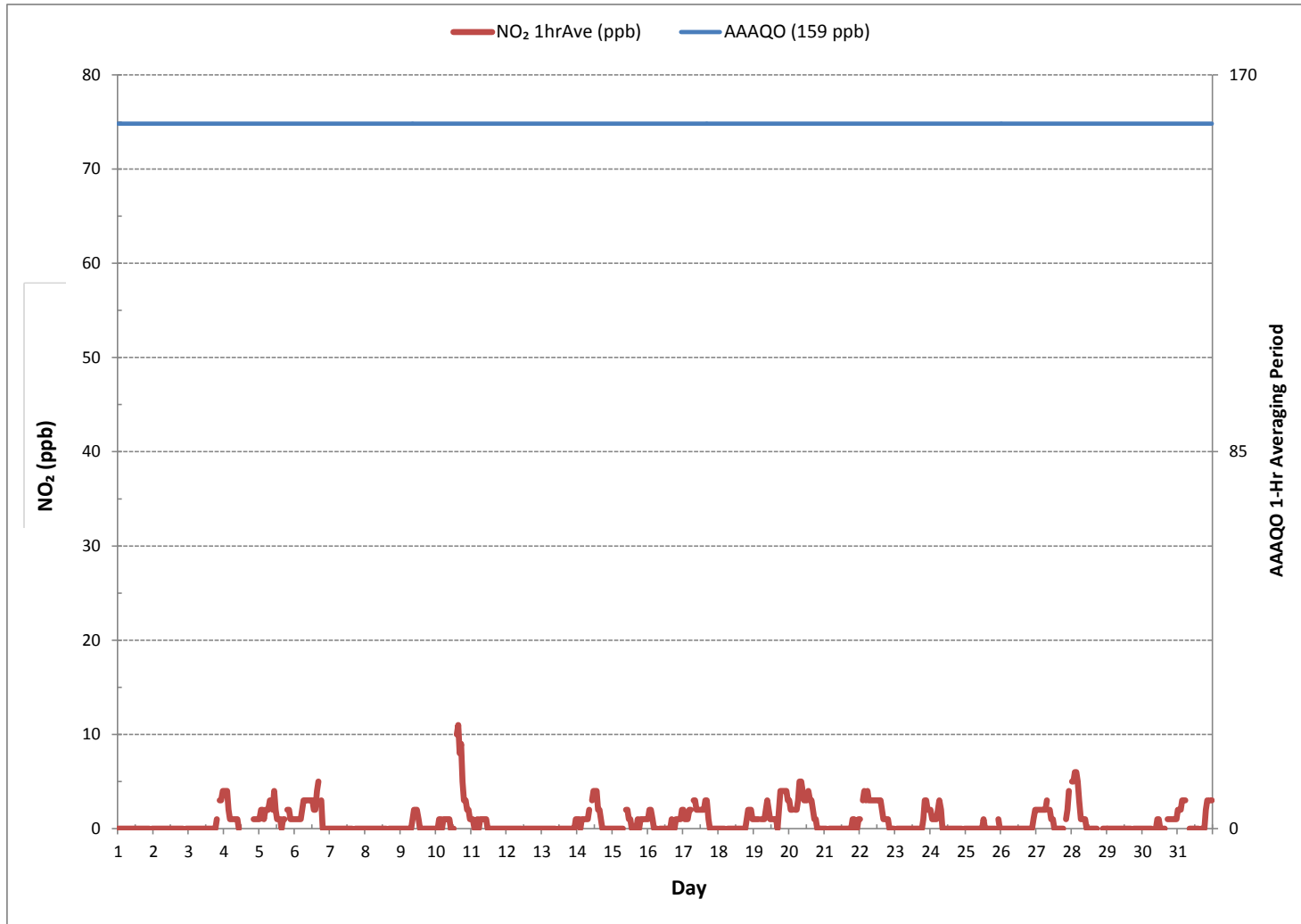
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0				
NUMBER OF NON-ZERO READINGS:	268				
MINIMUM 1-HR AVERAGE:	0 ppb	@ HOUR	1	ON DAY	1
MAXIMUM 1-HR AVERAGE:	11 ppb	@ HOUR	15	ON DAY	10
MAXIMUM 24-HR AVERAGE:	3 ppb			ON DAY	10
IZS CALIBRATION TIME:	32 hrs	OPERATIONAL TIME:	735 hrs		
MONTHLY CALIBRATION TIME:	7 hrs	AMD OPERATION UPTIME:	98.8 %		
STANDARD DEVIATION:	1	MONTHLY AVERAGE:	1 ppb		

24 HR AVERAGES October 2017



NITROGEN DIOXIDE Hourly Averages (NO₂ ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
St. Lina Continuous Monitoring Station - October 2017

NITROGEN DIOXIDE Instantaneous Maximum (NO₂ ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY 1	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	S	2	1	2	1	24	
2	1	2	1	1	2	1	1	1	1	1	2	2	2	1	1	1	1	1	1	1	1	1	S	2	2	1	2	1	24
3	2	2	2	1	2	2	2	2	2	1	2	1	1	1	6	2	2	2	2	3	S	5	5	6	1	6	2	24	
4	6	6	6	4	3	3	3	3	2	2	2	C	C	C	C	C	C	C	2	S	2	2	1	3	1	6	3	24	
5	4	12	9	3	14	3	5	14	3	3	13	2	3	5	2	2	6	7	S	2	2	8	2	2	2	14	5	24	
6	2	2	2	2	4	13	9	3	4	4	5	4	9	4	6	7	S	6	2	2	1	1	1	1	1	13	4	24	
7	1	1	0	0	0	1	0	1	0	1	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	1	0	24	
8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	1	0	0	0	1	2	1	0	0	2	0	24	
9	1	1	1	1	1	0	1	2	2	2	2	2	1	1	S	1	5	1	1	1	1	1	1	1	1	0	5	1	24
10	1	1	2	1	1	2	9	4	2	1	1	1	1	S	12	12	9	9	8	4	4	3	3	3	1	12	4	24	
11	2	2	1	1	2	2	2	2	3	4	2	S	2	1	2	1	1	1	0	1	1	1	1	1	0	4	2	24	
12	1	1	1	1	1	1	1	2	1	1	3	S	1	0	1	1	2	1	0	1	1	1	1	0	0	3	1	24	
13	0	0	0	1	1	2	2	2	0	2	S	1	0	0	1	1	1	1	1	1	1	2	2	2	3	0	3	1	24
14	2	2	2	2	2	2	3	3	3	S	4	10	5	5	5	3	2	2	1	9	1	1	1	1	1	10	3	24	
15	1	1	1	1	11	1	1	2	S	4	3	2	1	11	1	1	1	2	2	9	7	2	2	2	1	11	3	24	
16	3	3	3	2	1	1	1	S	1	1	1	1	1	1	1	14	3	2	2	3	2	2	3	3	1	14	2	24	
17	3	3	2	3	3	4	S	4	4	3	3	3	3	3	2	5	5	3	1	1	1	0	0	0	5	3	24		
18	0	1	1	1	0	S	1	1	1	1	1	0	1	1	1	1	1	1	1	3	3	3	3	2	0	3	1	24	
19	2	2	2	2	S	2	2	2	3	3	2	2	2	1	2	3	1	4	5	5	6	5	5	4	1	6	3	24	
20	4	3	3	S	2	2	5	6	5	4	4	9	9	5	4	3	3	2	2	2	1	1	1	1	1	9	4	24	
21	1	1	S	1	1	1	1	1	1	1	1	1	1	1	2	2	3	3	1	2	2	1	1	1	1	3	1	24	
22	1	S	3	4	4	4	4	4	4	5	4	3	3	3	3	3	2	2	2	2	1	1	1	1	1	5	3	24	
23	S	1	1	1	1	1	1	1	1	1	1	0	2	1	8	1	1	1	1	3	9	5	3	S	0	9	2	24	
24	3	2	2	2	2	3	4	3	2	1	1	1	0	0	0	1	1	1	2	1	1	1	1	S	2	0	4	2	24
25	1	1	1	1	1	1	1	1	2	1	1	2	2	1	2	1	1	2	1	1	1	1	S	1	1	1	2	1	24
26	1	1	0	0	0	1	1	1	2	2	2	1	1	1	1	2	2	8	2	S	3	3	4	0	8	2	2	24	
27	4	4	3	3	4	4	4	4	S1	S1	11	4	2	2	3	4	5	5	S	4	4	5	S1	2	11	4	21		
28	5	5	7	7	6	5	2	2	1	1	1	1	1	1	1	0	1	0	S	S1	S1	1	1	0	0	7	2	22	
29	0	0	0	0	0	0	0	0	0	0	12	1	1	1	1	1	S	1	1	0	1	0	1	0	1	0	12	1	24
30	1	1	1	1	1	1	2	S1	S1	2	3	2	2	4	4	4	S	5	4	4	4	4	3	4	1	5	3	22	
31	4	4	4	4	4	4	S1	S1	4	4	4	3	3	7	10	S	8	7	5	4	5	S1	4	4	3	10	5	21	
HOURLY MAX	6	12	9	7	14	5	13	14	5	5	13	10	9	11	12	14	9	9	8	9	9	8	5	6					
HOURLY AVG	2	2	2	2	2	2	3	3	2	2	3	2	2	2	3	3	3	2	2	2	2	2	2	2					

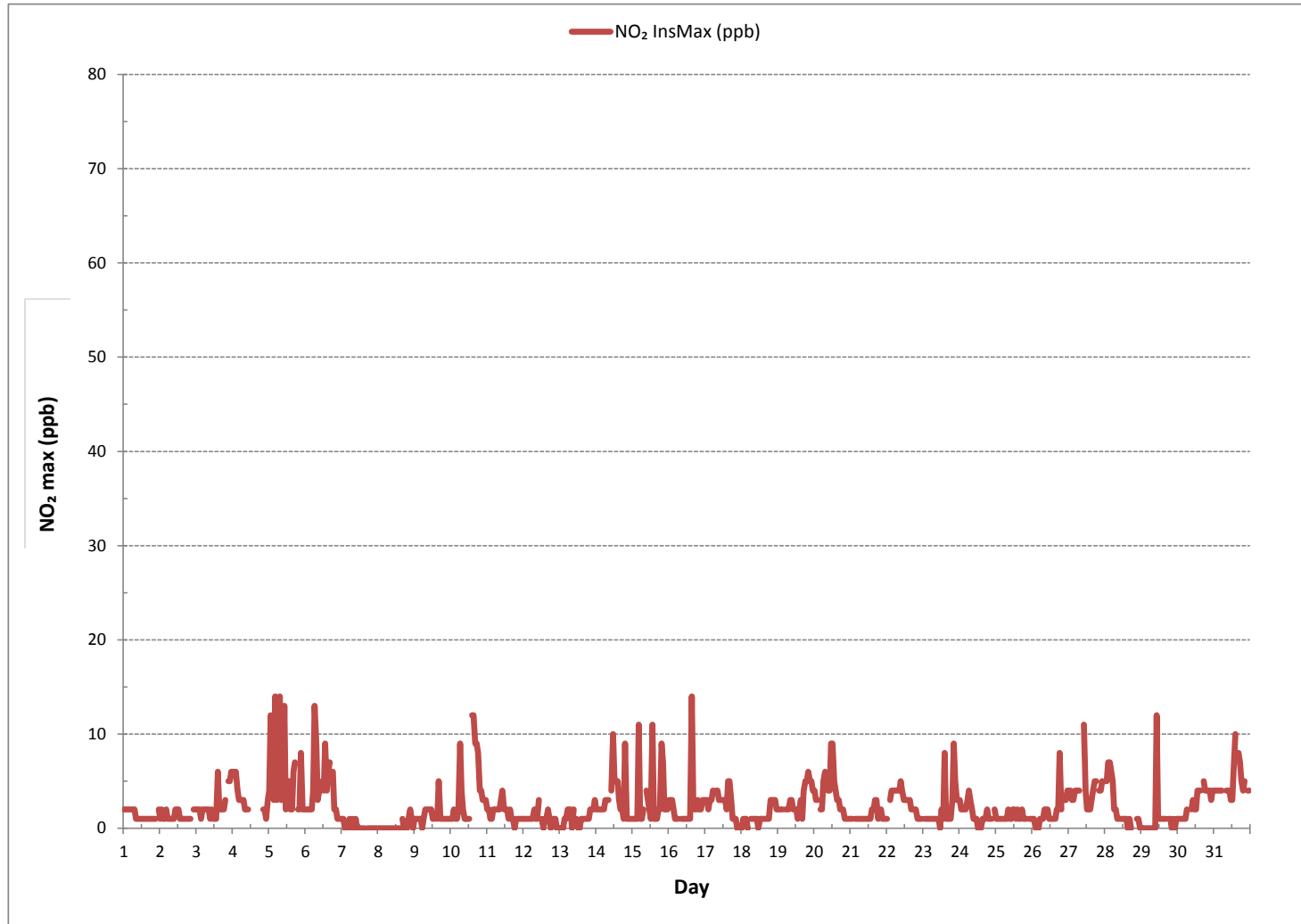
STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	618
MAXIMUM INSTANTANEOUS VALUE:	14 ppb @ HOUR 4 ON DAY 5
	VAR-VARIOUS
IZS CALIBRATION TIME:	32 hrs
MONTHLY CALIBRATION TIME:	7 hrs
OPERATIONAL TIME:	734 hrs
STANDARD DEVIATION:	2

NITROGEN DIOXIDE Instantaneous Maximum (NO₂ ppb)



Wind: LICA ST. LINA
 Poll.: LICA ST. LINA-NO₂[ppb]
 Monthly: 17/10
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 0.58% Calm Avg: 0.25 [ppb]

Direction	0.0-4.0	4.0-8.0	8.0-12.0	>12.0	Total
N	7.6	0.0	0.0	0.0	7.6
NE	3.3	0.1	0.6	0.0	4.0
E	5.9	0.3	0.0	0.0	6.2
SE	4.0	0.3	0.0	0.0	4.3
S	11.8	0.1	0.0	0.0	12.0
SW	20.0	1.2	0.0	0.0	21.2
W	17.2	0.4	0.0	0.0	17.6
NW	26.5	0.0	0.0	0.0	26.5
Summary	96.4	2.4	0.6	0.0	99.4

% Icon Classes (ppb)

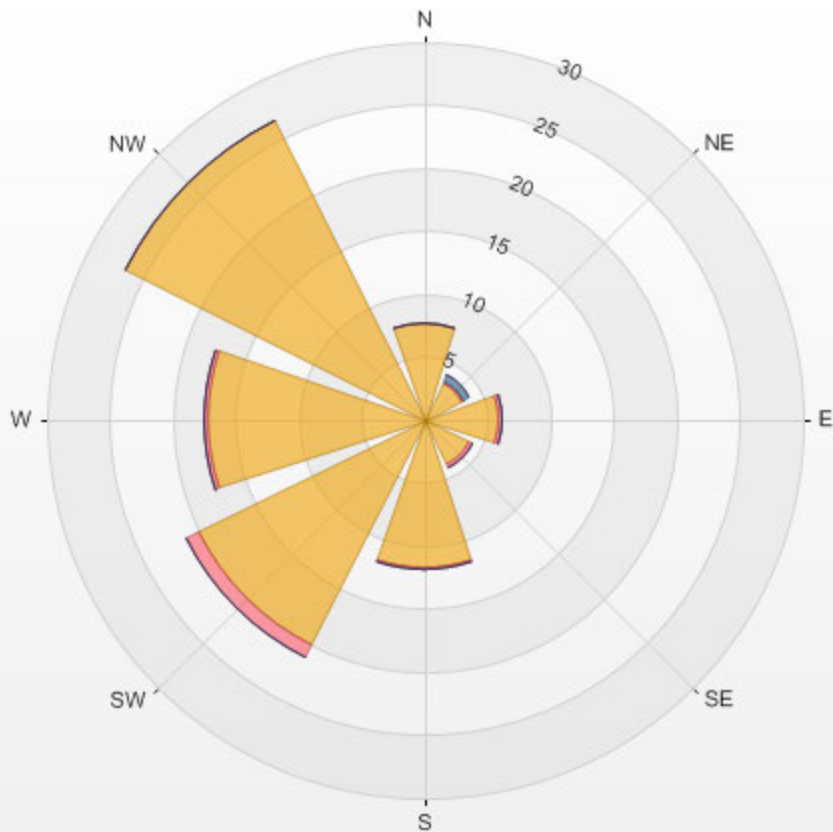
96 0.0-4.0

2 4.0-8.0

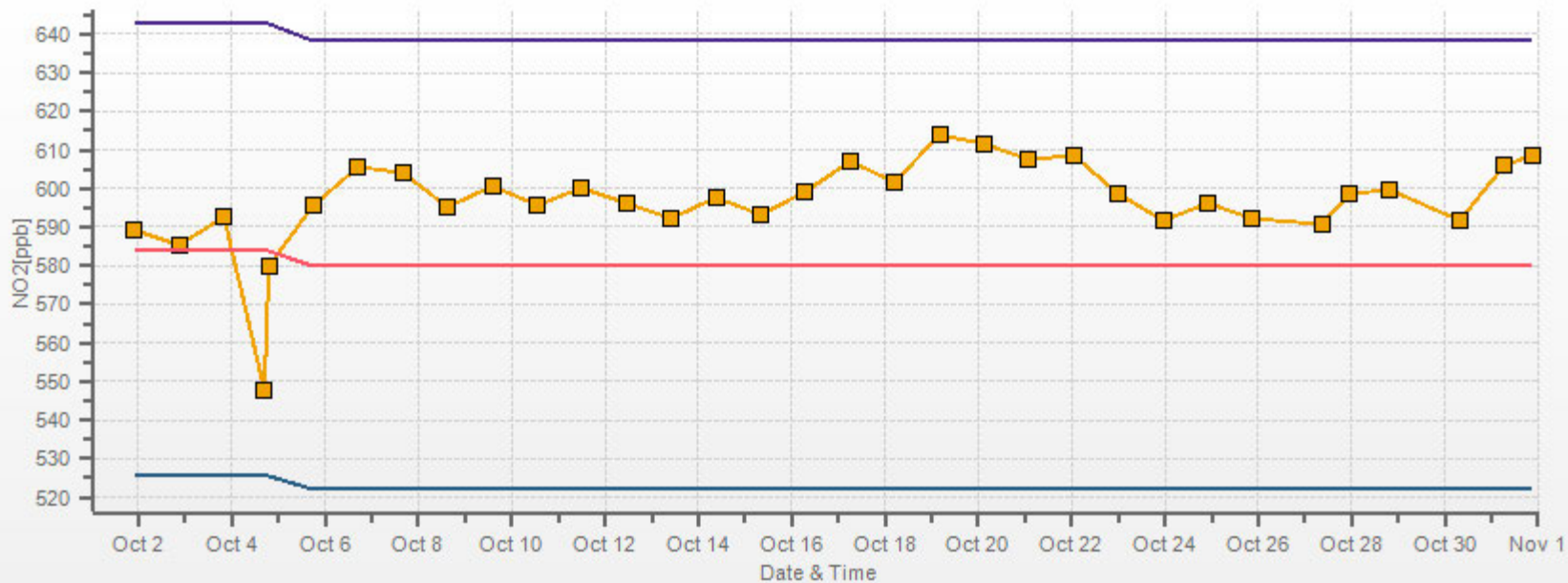
1 8.0-12.0

0 >12.0

LICA ST. LINA Poll.: LICA ST. LINA-NO2[ppb] 2017/10/01 00:00 - 2017/10/31 23:00 Calm: 0.58% Calm Poll Avg: 0.25[ppb]



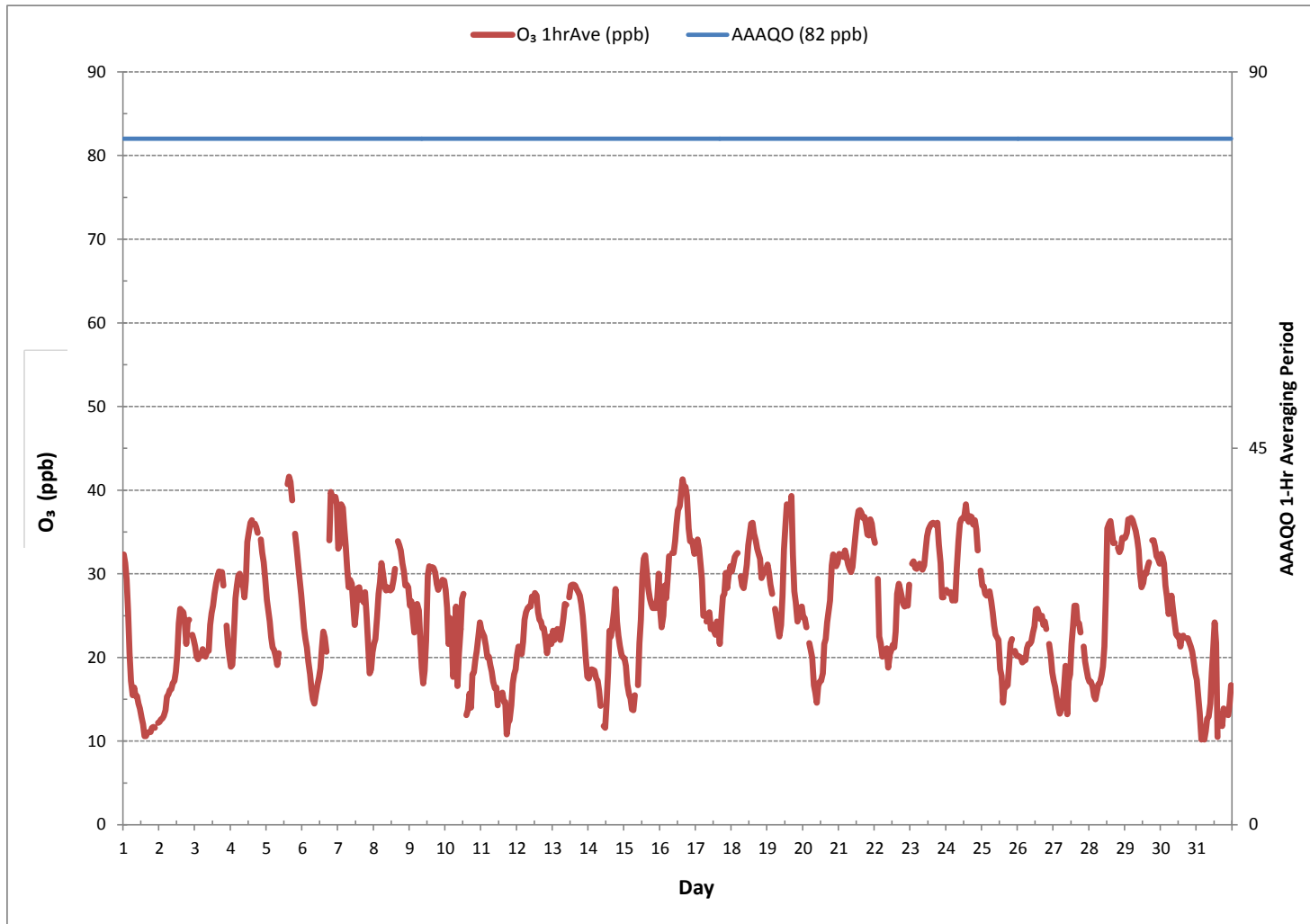
NO2[ppb] Calibration: LICA ST. LINA Monthly: 17/10 Type: Span



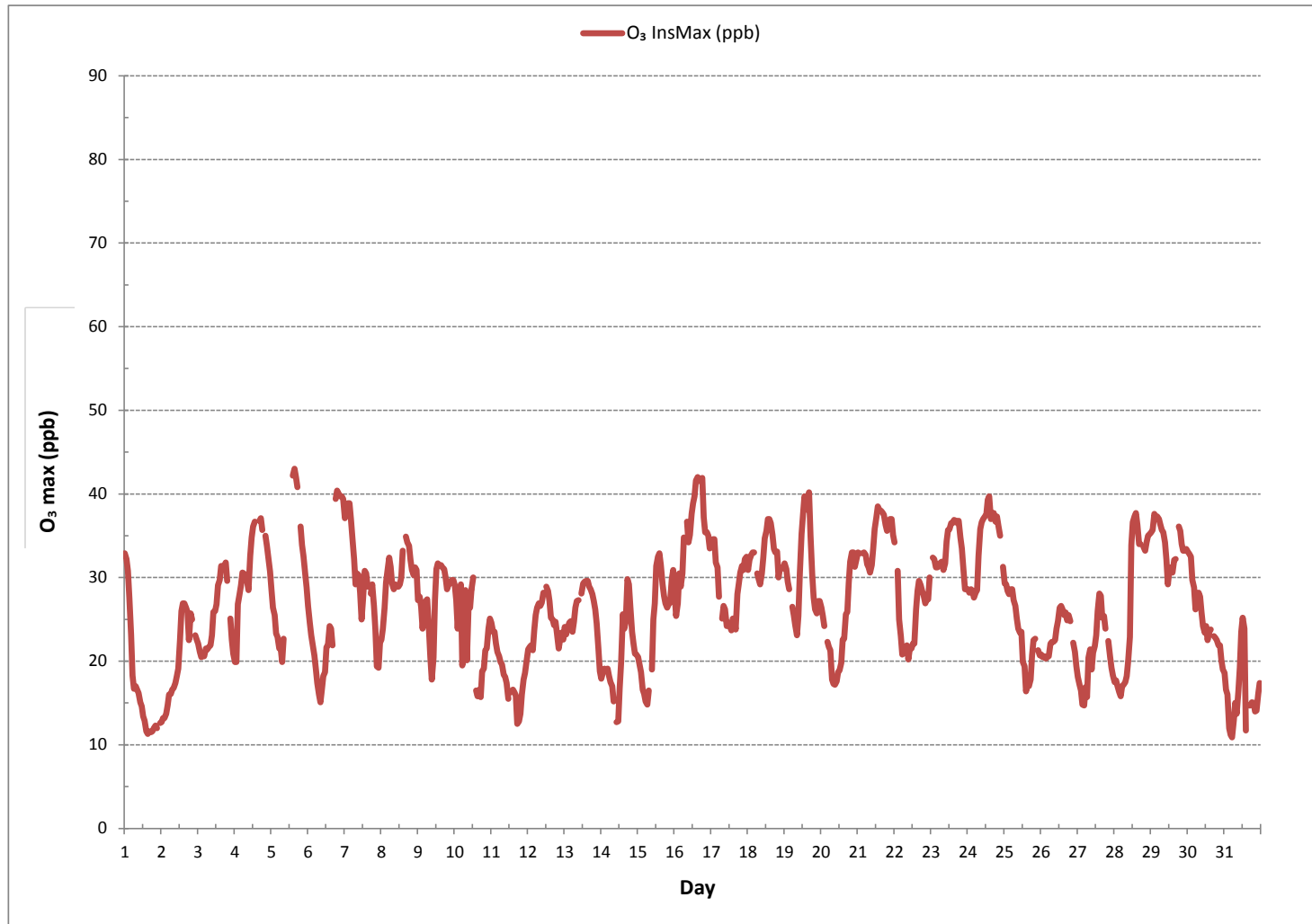
■ Span Meas
 — Span Ref
 — Span Low
 — Span High

OZONE

OZONE Hourly Averages (O₃ ppb)



OZONE Instantaneous Maximum (O₃ ppb)



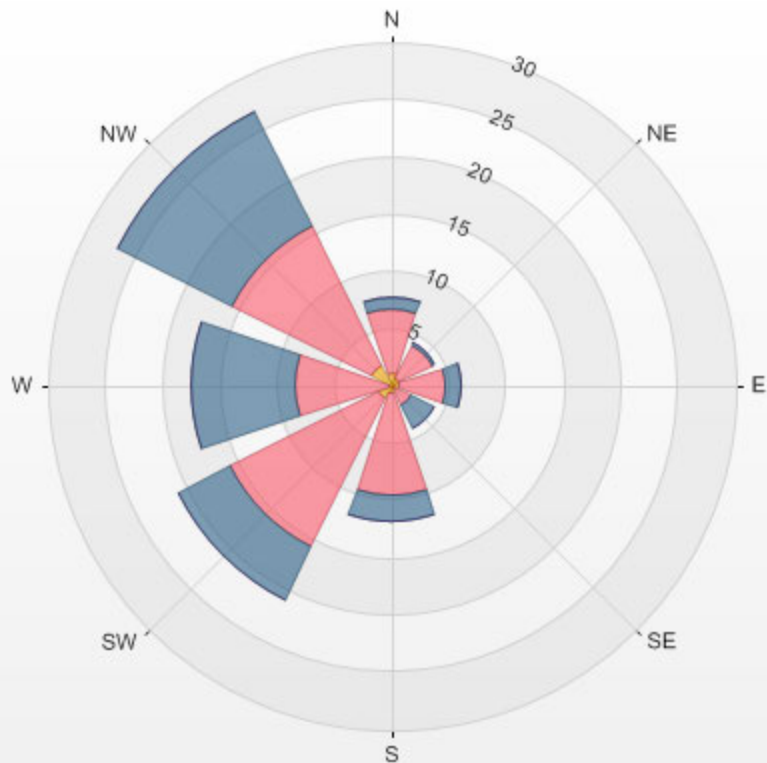
Wind: LICA ST. LINA
 Poll.: LICA ST. LINA-O₃[ppb]
 Monthly: 17/10
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 0.57% Calm Avg: 29.52 [ppb]

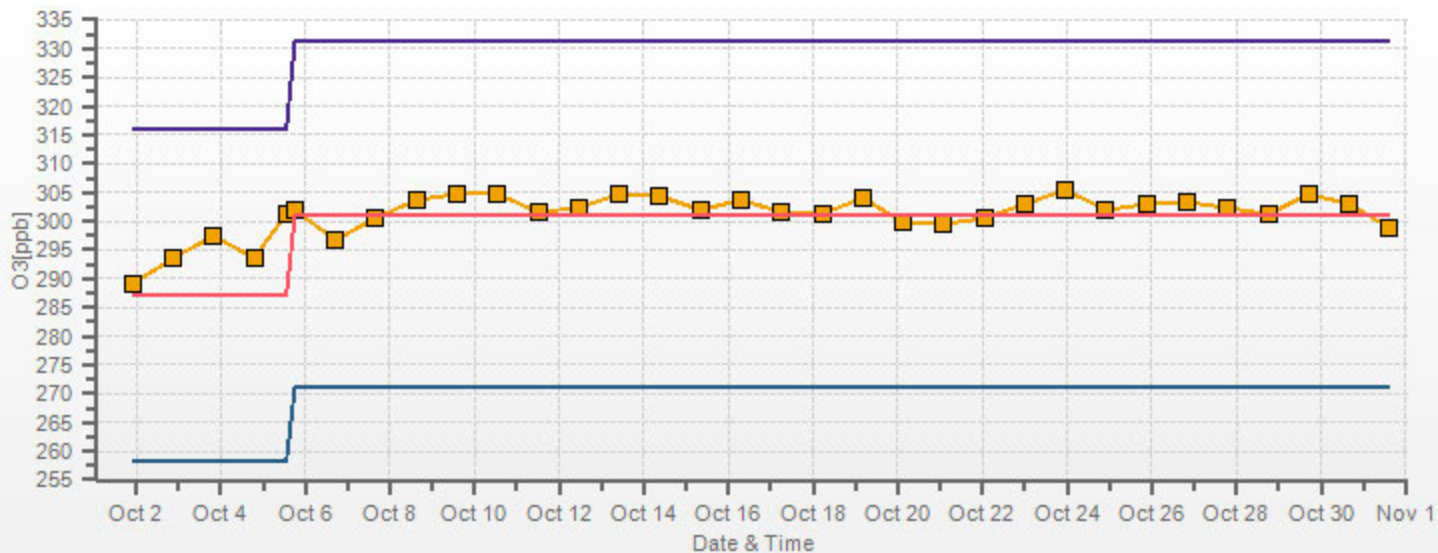
Direction	0.0-14.3	14.3-28.7	28.7-43.0	>43.0	Total
N	1.1	5.5	1.1	0.0	7.8
NE	0.7	3.3	0.3	0.0	4.3
E	0.7	4.0	1.4	0.0	6.1
SE	0.0	2.0	2.3	0.0	4.3
S	0.7	8.8	2.4	0.0	11.9
SW	1.3	14.5	5.1	0.0	20.9
W	0.3	8.1	9.1	0.0	17.5
NW	2.0	13.6	11.1	0.0	26.7
Summary	6.8	59.8	32.8	0.0	99.4

% Icon Classes (ppb) 7 0.0-14.3 60 14.3-28.7 33 28.7-43.0 0 >43.0

LICA ST. LINA Poll.: LICA ST. LINA-O3[ppb] 2017/10/01 00:00 - 2017/10/31 23:00 Calm: 0.57% Calm Poll Avg: 29.52[ppb]



O3[ppb] Calibration: LICA ST. LINA Monthly: 17/10 Type: Span



Span Meas Span Ref Span Low Span High

PARTICULATE MATTER 2.5

PARTICULATE MATTER < 2.5 MICRONS Hourly Averages (PM_{2.5} µg/m³)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY																													
1	2	2	2	2	2	2	2	0	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	2	1	24
2	0	0	0	0	0	0	0	0	1	1	1	2	2	2	1	1	1	1	1	1	1	1	1	1	1	0	2	1	24
3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	1	1	1	1	1	2	3	4	0	4	1	24	
4	4	4	3	2	2	2	2	2	2	2	2	1	1	1	1	1	27	1	1	1	1	1	1	1	1	27	3	24	
5	1	2	2	2	3	4	4	4	4	2	2	2	2	1	1	1	1	2	3	3	3	4	5	6	1	6	3	24	
6	6	5	6	7	7	9	11	12	11	10	9	8	7	6	5	5	5	4	3	3	3	2	2	2	2	12	6	24	
7	2	1	1	1	1	2	1	1	2	2	0	0	1	1	1	1	0	0	0	0	0	0	0	0	0	2	1	24	
8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1	1	0	0	1	0	24	
9	1	1	1	1	1	1	1	1	1	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	24	
10	1	1	2	1	1	2	2	1	1	1	1	1	2	2	2	2	2	2	Y	2	2	2	1	1	1	2	1	23	
11	1	1	1	1	1	1	1	6	2	2	2	1	1	1	0	0	0	0	0	0	0	0	0	0	0	6	1	24	
12	0	0	1	1	2	2	2	2	2	3	3	3	3	1	1	1	1	1	1	2	2	1	6	1	0	6	2	24	
13	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	3	1	3	1	24	
14	4	3	3	7	7	7	9	10	12	12	12	12	10	8	5	4	4	4	3	3	2	2	2	1	1	12	6	24	
15	1	1	1	2	2	2	2	2	3	3	3	3	3	2	2	1	1	1	1	1	2	2	2	2	1	3	2	24	
16	2	3	3	2	2	1	1	1	1	1	1	C	C	1	1	1	2	2	2	3	3	2	2	3	1	3	2	24	
17	3	3	4	4	5	5	6	5	4	3	3	3	3	3	2	2	2	2	1	1	1	1	1	1	1	6	3	24	
18	1	1	1	1	1	1	1	2	3	3	2	2	2	1	1	2	2	2	2	2	2	2	2	2	1	3	2	24	
19	2	3	3	3	3	2	2	2	3	3	2	1	1	1	1	1	1	2	2	2	4	4	4	3	1	4	2	24	
20	2	2	2	3	4	4	4	5	4	4	6	7	7	8	7	5	3	3	2	2	2	2	2	3	2	8	4	24	
21	3	3	4	3	3	3	3	3	3	2	3	3	3	3	3	3	3	3	3	3	3	4	3	3	2	4	3	24	
22	3	3	3	4	4	5	5	4	4	5	5	4	4	4	4	3	3	3	3	2	2	2	2	1	1	5	3	24	
23	1	0	1	1	1	1	1	1	1	1	2	2	2	2	2	1	1	1	1	2	3	3	3	0	3	2	24		
24	3	3	3	3	3	3	3	3	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	3	2	24	
25	1	1	1	1	2	2	1	1	2	2	1	1	1	0	1	1	1	2	2	3	5	6	5	0	6	2	24		
26	4	2	2	2	1	1	1	2	2	2	4	4	5	4	5	4	4	5	5	6	7	9	10	1	10	4	24		
27	9	10	10	10	11	10	8	7	5	8	6	6	5	5	4	5	5	4	4	4	4	5	6	8	4	11	7	24	
28	8	7	7	7	6	4	2	2	2	3	4	3	2	2	2	1	1	1	1	1	1	0	0	0	0	8	3	24	
29	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24	
30	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	2	1	2	2	2	2	2	2	3	0	3	1	24	
31	3	4	3	4	3	3	4	4	5	10	7	7	6	5	6	7	6	5	4	4	5	5	5	5	3	10	5	24	
HOURLY MAX	9	10	10	10	11	10	11	12	12	12	12	12	10	8	7	7	6	27	5	5	6	7	9	10					
HOURLY AVG	2	2	2	2	3	3	3	3	3	3	3	3	3	2	2	2	2	3	2	2	2	2	2	2					

STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

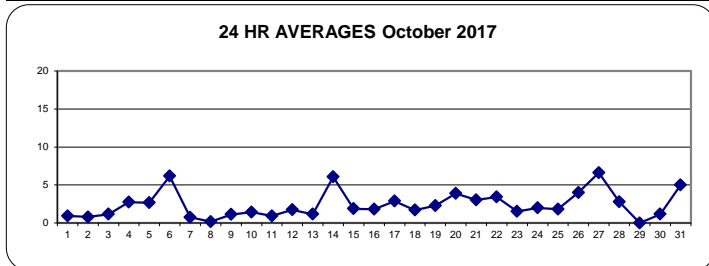
OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT:	1-HR	80	µg/m ³	24-HR	30	µg/m ³
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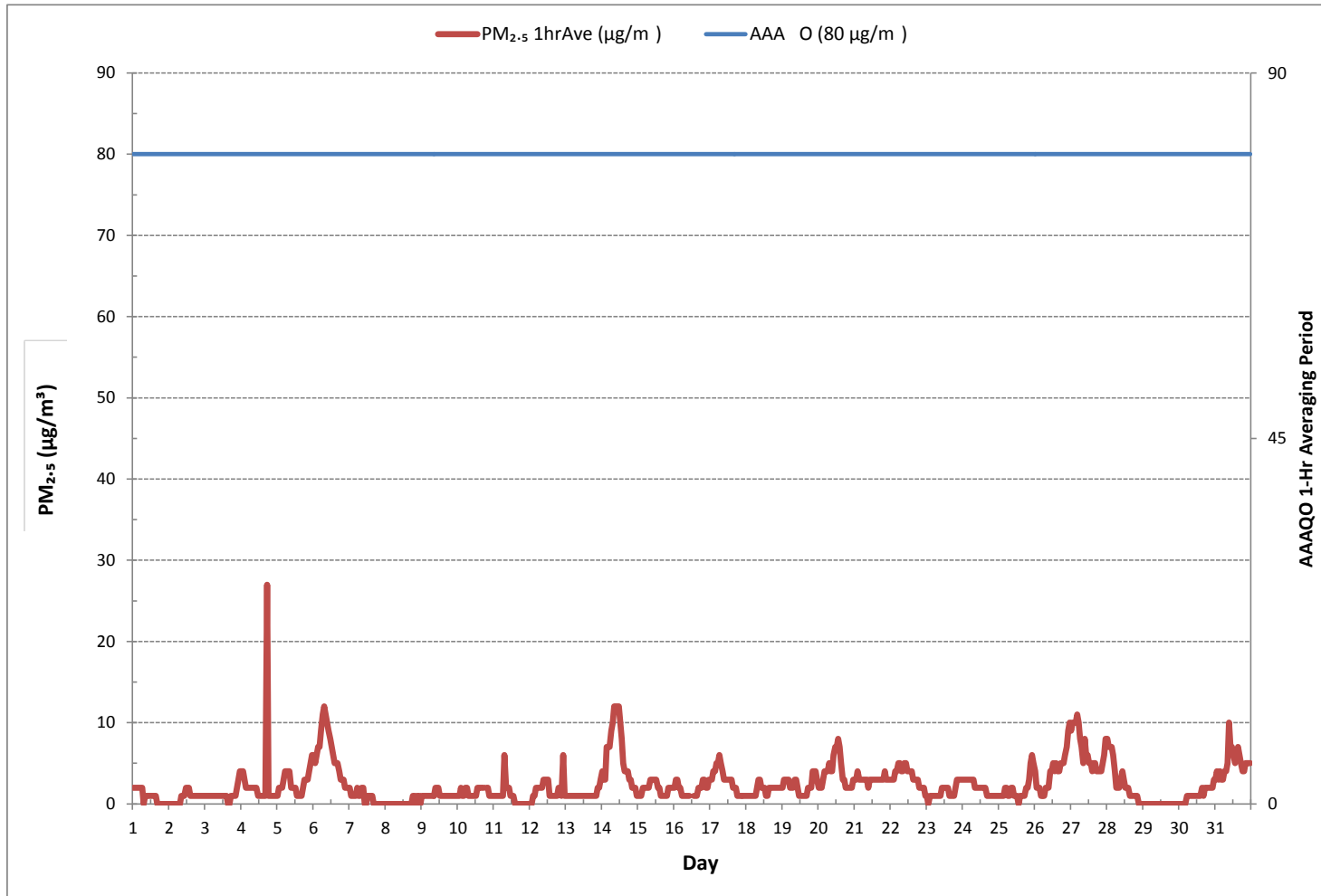
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0			
NUMBER OF 24-HR EXCEEDANCES:	0			
NUMBER OF NON-ZERO READINGS:	646			
MINIMUM 1-HR AVERAGE	0 µg/m ³ @ HOUR	7	ON DAY	1
MAXIMUM 1-HR AVERAGE:	27 µg/m ³ @ HOUR	17	ON DAY	4
MAXIMUM 24-HR AVERAGE:	7 µg/m ³		ON DAY	27
MONTHLY CALIBRATION TIME:	2 hrs	OPERATIONAL TIME:	743	hrs
STANDARD DEVIATION:	2	AMD OPERATION UPTIME:	99.9	%
		MONTHLY AVERAGE:	2	µg/m ³

24 HR AVERAGES October 2017



PARTICULATE MATTER < 2.5 MICRONS Hourly Averages (PM_{2.5} µg/m³)



Wind: LICA ST. LINA
 Poll.: LICA ST. LINA-PM25[ug/m³(L)]
 Monthly: 17/10
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

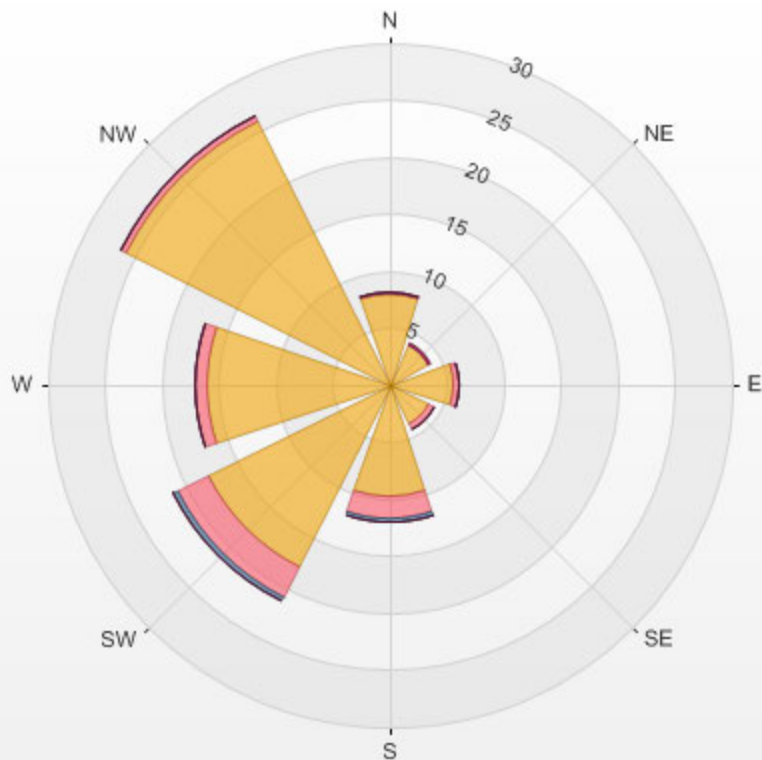
Calm: 0.54%

Calm Avg: 1.03 [ug/m³]

Direction	0.0-5.6	5.6-11.2	11.2-16.8	16.8-22.4	22.4-28.0	>28.0	Total
N	8.0	0.1	0.0	0.0	0.0	0.0	8.1
NE	3.9	0.0	0.0	0.0	0.1	0.0	4.1
E	5.7	0.4	0.0	0.0	0.0	0.0	6.1
SE	3.9	0.4	0.0	0.0	0.0	0.0	4.3
S	9.9	1.9	0.3	0.0	0.0	0.0	12.0
SW	17.9	3.0	0.4	0.0	0.0	0.0	21.3
W	16.1	1.1	0.0	0.0	0.0	0.0	17.2
NW	25.9	0.5	0.0	0.0	0.0	0.0	26.4
Summary	91.2	7.5	0.7	0.0	0.1	0.0	99.5

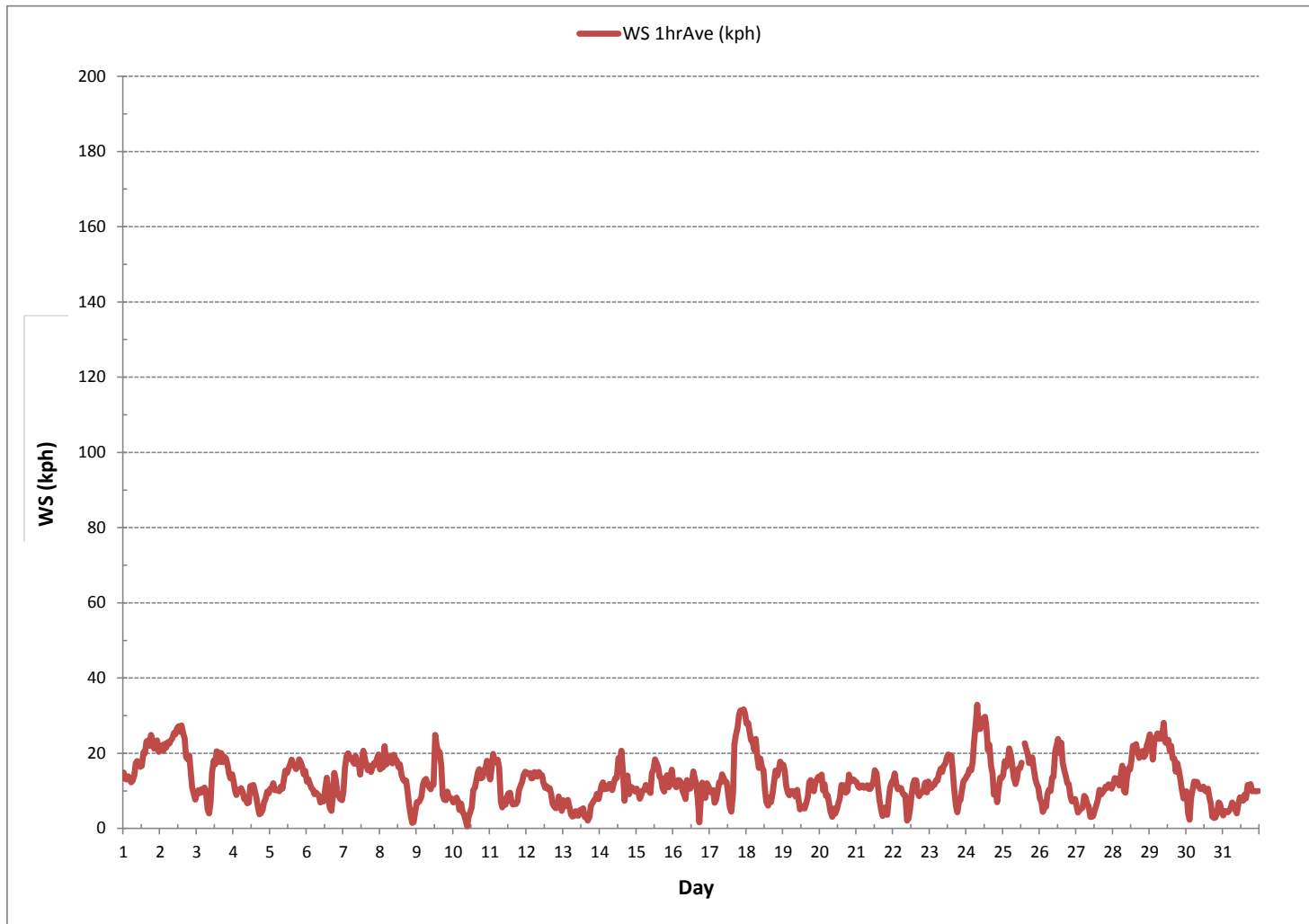
% Icon	Classes (ug/m3(L))	91	 0.0-5.6	7	 5.6-11.2	1	 11.2-16.8	0	 16.8-22.4	0	 22.4-28.0	0	 >28.0
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LICA ST. LINA Poll.: LICA ST. LINA-PM25[ug/m3(L)] 2017/10/01 00:00 - 2017/10/31 23:00 Calm: 0.54% Calm Poll Avg: 1.03[ug/m3(L)]

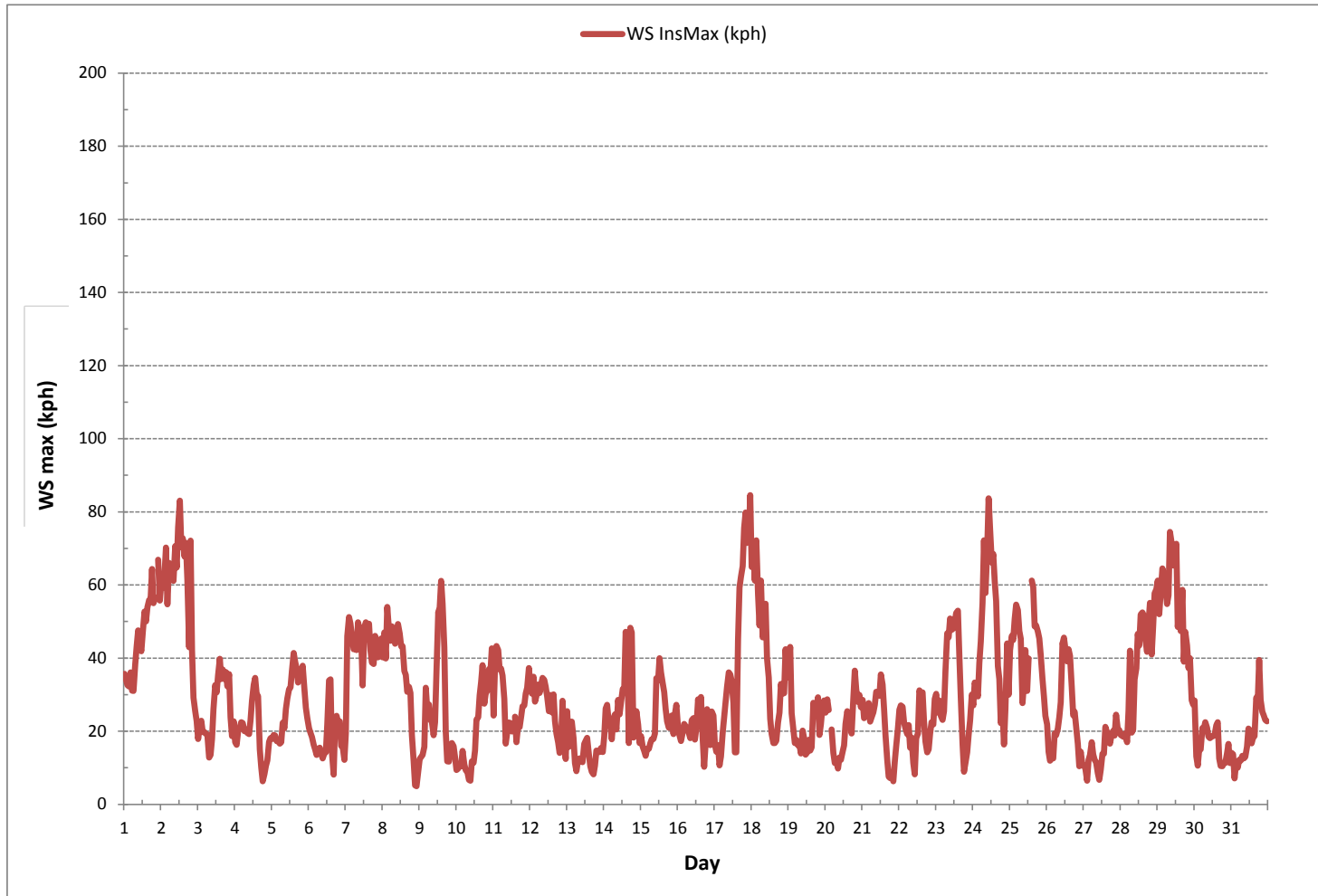


WIND SPEED

WIND SPEED Hourly Averages (WS kph)



WIND SPEED Instantaneous Maximum (WS kph)



Wind: LICA ST. LINA
 Monitor: WSP [kph]
 Monthly: 17/10
 Type: WindRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 0.54%

Direction	1.8-6.6	6.6-13.2	13.2-19.8	19.8-26.4	26.4-33.0	>33.0	Total
N	1.6	2.3	1.1	2.6	0.5	0.0	8.1
NE	0.4	1.4	2.3	0.1	0.0	0.0	4.2
E	0.7	3.6	1.8	0.1	0.0	0.0	6.2
SE	1.4	2.2	0.8	0.0	0.0	0.0	4.3
S	2.0	8.8	1.2	0.0	0.0	0.0	12.0
SW	2.4	11.3	6.3	1.2	0.0	0.0	21.3
W	2.7	7.7	4.2	1.5	1.2	0.0	17.2
NW	2.3	9.6	8.8	4.6	1.1	0.0	26.3
Summary	13.5	46.7	26.4	10.1	2.8	0.0	99.5

% Icon Classes (kph)

13  1.8-6.6

47  6.6-13.2

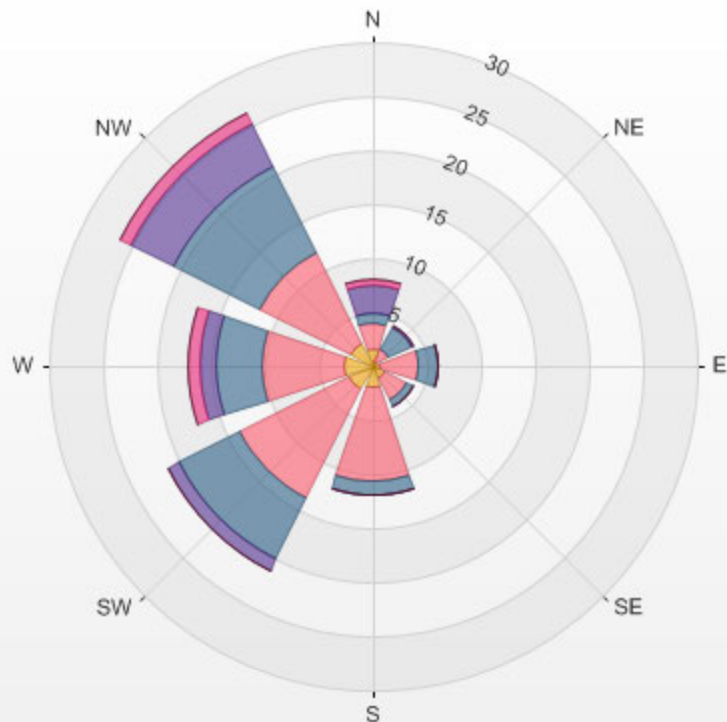
26  13.2-19.8

10  19.8-26.4

3  26.4-33.0

0  >33.0

LICA ST. LINA 2017/10/01 00:00 - 2017/10/31 23:00 Calm: 0.54% Calm Wind Avg Speed: 1.36(kph)



WIND DIRECTION



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
St. Lina Continuous Monitoring Station - October 2017

WIND DIRECTION Hourly Averages (WD)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	24-HOUR AVG	24-HR		
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	QUADRANT	RDGS.		
DAY 1	WNW	WNW	WNW	WNW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NNW	NW	NNW	NNW	NNW	NNW	NNW	NW	24		
2	NNW	NNW	NNW	N	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	N	N	N	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	24	
3	NW	NW	NW	WNW	WNW	NW	NW	WNW	W	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	WSW	WSW	24	
4	WSW	WSW	W	WNW	NW	NW	WNW	WNW	NW	WNW	WNW	NW	NW	NNW	N	N	N	NNE	E	SE	S	S	S	S	SW	SW	24	
5	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	24
6	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	24
7	WSW	W	W	W	W	WSW	WSW	WSW	W	W	WNW	WNW	WNW	NW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	NW	NW	NW	NW	WNW	24	
8	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	SSW	S	NW	24	
9	S	SSW	SSW	S	S	S	SSW	SSW	SSW	SW	SW	SSW	WSW	W	W	WSW	WSW	WSW	SW	SW	WSW	W	W	W	W	SW	24	
10	WSW	WSW	WSW	W	WSW	SSW	WSW	WNW	WSW	SSW	SE	ESE	ENE	NE	NE	NE	NE	NE	ENE	NE	NE	NE	NE	ENE	SE	SE	24	
11	NE	NE	NE	NE	NE	NE	NE	NNE	NNE	NNW	NNW	NNW	WNW	N	N	NNW	NW	NNW	NNW	NNW	NNW	NNW	NNW	NW	SSW	24		
12	NW	NW	NNW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	N	N	N	N	N	WNW	24	
13	N	NNE	N	N	N	NE	NE	NNE	NNW	NNW	NNW	NW	WNW	WNW	NW	NNW	NNW	ENE	ESE	SE	S	S	SSW	S	SSW	24		
14	SSW	SSW	S	SSW	S	S	S	S	SSW	SSW	SW	SW	SW	SW	WSW	WSW	WSW	WSW	W	WSW	WSW	W	W	W	W	SW	24	
15	W	W	SW	WSW	WSW	SW	SW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	24
16	SW	SW	SW	SW	SW	WSW	WSW	W	WSW	SW	WSW	WSW	WSW	SW	SW	SW	SW	S	ESE	E	E	E	SSE	S	SSW	24		
17	SSW	SSW	SSW	SSW	S	S	S	SSE	SSE	SSE	S	S	SSE	SE	SE	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	SW	24	
18	WNW	WNW	WNW	W	W	W	W	W	W	W	WNW	WNW	WNW	WNW	WSW	S	SSE	SE	SE	ESE	ESE	ESE	ESE	ESE	ESE	SW	24	
19	SE	SSE	SSE	SSE	S	SSW	SSW	SW	SW	WSW	W	WSW	SSW	SSW	S	SE	SE	ESE	ESE	ESE	ESE	E	E	E	E	SSE	24	
20	ENE	E	ENE	ENE	ENE	E	ESE	SSE	SE	WSW	NW	W	NW	NW	NW	NW	NW	NW	NW	NNW	NW	WNW	WNW	NW	SW	24		
21	NW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	SSW	SSW	SSE	ESE	ESE	ESE	W	24
22	ESE	SE	ESE	E	E	E	E	E	E	ESE	SSW	SW	W	WNW	WNW	WNW	W	W	W	WSW	WSW	W	W	W	SSW	24		
23	W	W	W	W	W	W	W	W	W	W	WNW	WNW	WNW	W	W	W	W	SW	S	S	S	S	S	S	SSW	24		
24	SSW	S	S	SSW	SW	SW	WSW	WSW	W	W	WNW	WNW	WNW	NW	NW	NW	WNW	NW	NW	N	N	NE	ENE	ENE	WSW	24		
25	E	ENE	ENE	E	E	E	ENE	E	ENE	ENE	ENE	NNE	X	N	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NW	S	23		
26	NW	WNW	WNW	W	WSW	SW	SW	SW	SW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	24
27	WSW	WSW	SW	WSW	WSW	WSW	W	WNW	W	WSW	SSW	S	SSW	SSW	SSW	SSW	SSW	S	SSW	S	S	S	S	S	SSW	SSW	24	
28	SW	SW	WSW	WSW	SW	WSW	WSW	WSW	WNW	WNW	NW	WNW	WNW	WNW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NNW	WNW	24	
29	NW	NW	NW	NW	NW	NW	NW	NW	NW	NNW	NW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	24
30	NW	NW	W	SW	SW	SW	SSW	SW	SW	SSW	S	SSW	SSW	SSW	SSW	SSW	SSW	ESE	S	WSW	WNW	NW	WNW	SW	SW	24		
31	W	WSW	SW	S	S	SSW	SSW	SSW	S	SSE	SSE	SSE	SE	SE	ESE	E	E	ENE	ENE	ENE	ENE	NE	NE	NE	NNE	SE	24	

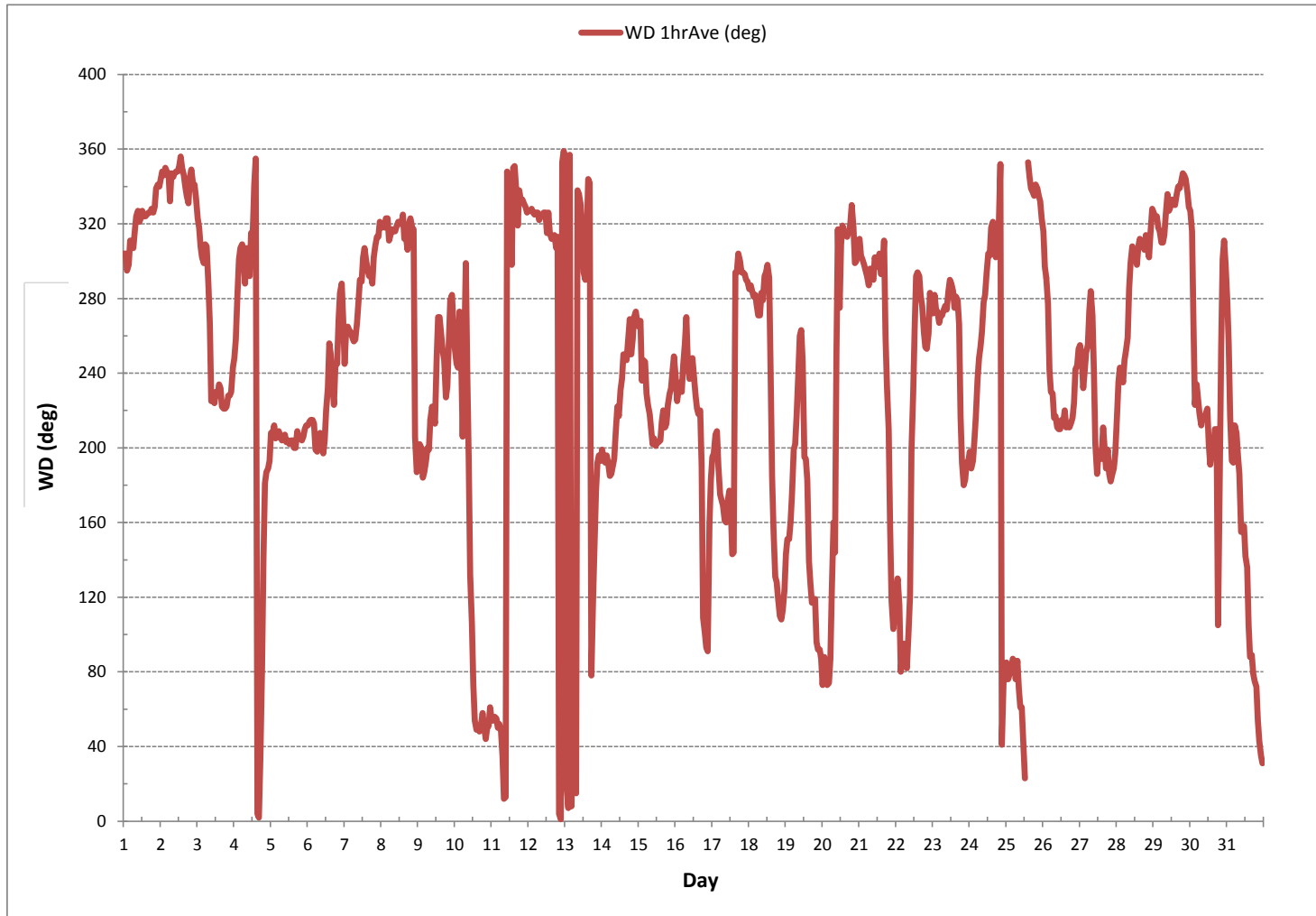
STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

LAST CALIBRATION:	May 25, 2017
DECLINATION :	MAGNETIC DECLINATION 19 DEGREE EAST

MONTHLY CALIBRATION TIME:	0	hrs	OPERATIONAL TIME:	743	hrs
STANDARD DEVIATION:	84		AMD OPERATION UPTIME:	99.9	%
			MONTHLY AVERAGE:	282	(W)

WIND DIRECTION Hourly Averages (WD)



STANDARD DEVIATION WIND DIRECTION



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
 St. Lina Continuous Monitoring Station - October 2017

STANDARD DEVIATION WIND DIRECTION Hourly Averages (STDWD deg)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59		
DAY																										
1	15	16	16	16	16	15	15	16	15	16	15	16	16	17	15	15	14	14	15	15	22	18	17	17	24	
2	22	17	17	17	17	17	39	25	17	16	17	21	18	18	17	17	17	17	14	16	17	16	16	20	24	
3	11	11	11	11	11	10	10	14	14	14	13	13	15	11	11	12	10	8	8	8	7	6	5	5	24	
4	4	5	10	12	12	10	12	15	15	18	24	18	22	25	22	21	19	11	5	10	6	5	8	8	24	
5	8	8	6	8	9	6	7	9	11	12	12	13	15	14	13	15	13	10	11	10	11	11	10	6	24	
6	6	5	6	5	6	7	8	7	8	9	12	13	16	8	16	12	8	10	7	7	12	11	12	8	24	
7	7	11	12	11	12	9	9	10	14	16	16	17	16	16	16	17	17	17	15	16	14	14	14	15	24	
8	14	15	15	14	15	15	15	14	15	14	16	16	17	15	16	16	15	15	15	17	19	15	21	10	24	
9	8	8	10	11	11	11	12	13	11	9	11	12	12	17	15	11	9	7	6	5	7	11	9	6	24	
10	8	3	9	7	17	8	22	13	42	52	25	19	17	14	12	13	11	11	12	12	11	12	11	11	24	
11	10	10	10	11	11	10	11	30	21	16	18	15	14	49	20	19	17	15	17	16	14	15	14	14	24	
12	13	15	13	13	13	13	14	14	14	14	15	18	17	16	15	17	15	17	16	14	20	20	17	19	24	
13	17	16	17	18	19	14	21	20	21	31	25	25	29	38	27	24	10	7	9	8	8	8	8	8	24	
14	10	11	11	11	9	8	10	12	12	12	9	10	10	11	10	9	8	13	13	9	8	10	10	7	24	
15	8	8	9	5	5	5	4	6	8	11	11	13	13	12	13	11	10	10	10	7	6	8	6	7	24	
16	6	7	6	5	6	6	8	13	16	10	12	12	13	12	14	14	10	26	6	8	10	12	9	10	24	
17	8	5	5	7	7	8	8	9	12	14	15	15	14	16	17	44	16	16	15	16	16	16	16	16	24	
18	16	16	16	16	16	14	13	13	15	16	16	17	19	27	18	15	12	10	11	12	11	12	11	13	24	
19	14	14	13	13	11	9	10	6	10	12	19	33	26	22	25	20	9	10	11	11	8	7	9	7	24	
20	7	8	9	7	8	6	14	21	25	30	31	20	16	16	13	14	13	12	13	13	13	14	14	14	24	
21	13	13	14	14	13	12	13	14	16	17	19	19	17	20	22	13	22	7	6	7	6	3	8	8	24	
22	10	12	13	11	8	9	10	10	11	42	24	23	16	16	16	13	12	6	7	7	9	15	15	24		
23	13	15	13	13	10	12	12	14	14	15	17	16	16	17	15	16	14	9	13	7	10	9	10	10	24	
24	10	11	11	10	11	9	9	8	11	15	17	17	17	X	16	14	16	16	15	14	15	13	12	12	23	
25	12	11	12	12	12	14	12	12	12	13	12	12	12	30	23	15	14	15	17	15	15	15	14	14	24	
26	14	13	13	13	11	7	8	9	9	11	11	11	11	11	9	10	10	9	9	8	6	5	6	5	24	
27	6	7	4	8	5	7	6	9	8	14	15	23	22	18	17	11	10	9	9	11	10	9	9	9	24	
28	6	4	5	4	6	6	7	10	12	15	14	17	16	16	15	14	15	14	15	14	14	15	15	16	24	
29	14	14	15	14	14	15	15	15	16	18	13	14	15	15	16	15	15	15	15	16	21	16	16	17	24	
30	14	19	16	7	5	5	8	9	8	8	9	9	12	13	12	13	8	15	14	15	9	9	11	12	24	
31	12	8	7	22	8	8	10	13	12	13	13	14	16	15	11	13	11	11	12	12	12	12	12	11	24	

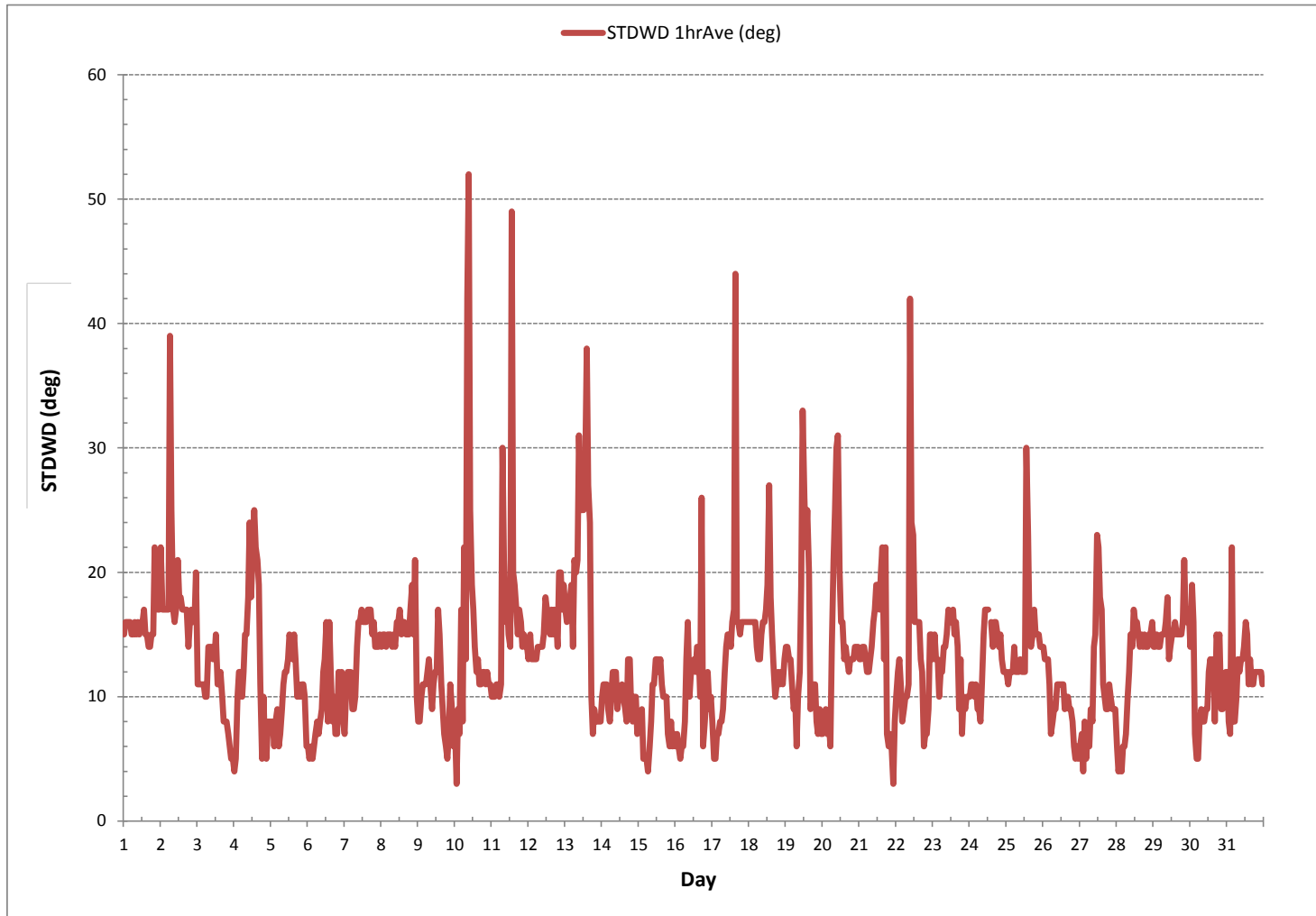
STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

LAST CALIBRATION: May 25, 2017

CALIBRATION TIME: 0 hrs OPERATIONAL TIME: 743 hrs

STANDARD DEVIATION WIND DIRECTION Hourly Averages (STDWD deg)



RELATIVE HUMIDITY



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
 St. Lina Continuous Monitoring Station - October 2017

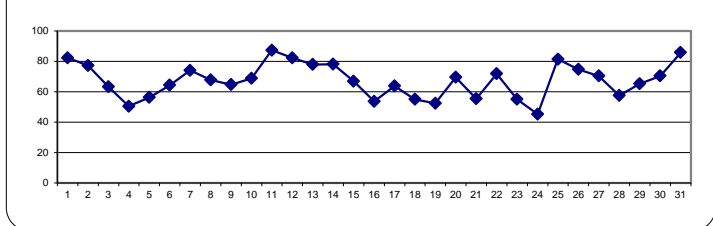
RELATIVE HUMIDITY Hourly Averages (RH %)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY																													
1	58	61	67	76	86	88	89	86	84	82	80	80	80	83	85	86	87	88	87	88	88	89	88	88	88	58	89	82	24
2	87	87	87	87	87	87	87	87	87	86	85	81	75	69	65	60	58	63	70	67	69	72	74	76	58	87	77	24	
3	77	79	81	80	80	78	79	69	62	61	59	55	49	47	44	42	43	47	53	60	65	68	70	70	42	81	63	24	
4	72	72	67	60	58	56	55	55	47	47	43	38	36	35	34	34	36	42	48	49	52	56	58	61	34	72	50	24	
5	67	70	70	72	72	76	76	70	61	51	46	40	36	33	30	31	34	41	50	57	62	65	69	72	30	76	56	24	
6	75	77	78	80	83	84	85	79	70	62	62	62	60	56	54	53	56	56	48	47	51	54	54	56	47	85	64	24	
7	62	62	58	58	61	65	70	69	66	79	85	87	86	77	76	81	78	75	80	83	82	80	81	58	87	74	24		
8	83	82	78	74	72	71	73	72	72	75	74	68	62	59	57	55	54	56	58	62	64	66	69	70	54	83	68	24	
9	76	77	78	78	76	73	72	75	74	77	82	76	57	46	45	46	46	51	54	56	57	57	59	63	45	82	65	24	
10	67	71	77	73	73	84	79	67	76	65	60	54	52	56	62	63	63	65	67	72	77	77	75	76	52	84	69	24	
11	81	84	84	84	85	87	88	88	88	88	88	88	87	88	88	89	89	89	89	89	89	89	88	88	81	89	87	24	
12	87	87	87	88	88	88	87	86	84	81	77	74	76	76	78	79	79	80	80	82	84	82	81	82	74	88	82	24	
13	80	82	82	82	83	83	82	82	79	77	77	75	72	71	69	65	64	74	79	80	81	82	83	84	64	84	78	24	
14	84	83	81	81	81	84	85	84	83	81	79	76	68	61	58	59	62	66	83	87	88	87	86	87	58	88	78	24	
15	86	86	87	89	89	89	89	85	83	78	69	61	55	51	46	47	47	49	52	53	53	54	55	53	46	89	67	24	
16	59	62	64	65	69	68	68	62	61	57	54	49	45	41	36	34	39	44	50	50	52	53	52	52	34	69	54	24	
17	53	54	58	61	61	66	66	66	60	54	51	49	51	51	49	51	75	86	84	81	80	79	75	68	49	86	64	24	
18	67	65	65	68	70	73	72	69	63	57	50	44	41	35	36	43	47	51	51	51	53	51	49	50	35	73	55	24	
19	50	52	56	58	62	65	67	68	60	51	45	41	40	38	38	41	42	48	50	52	57	58	58	61	38	68	52	24	
20	64	67	71	75	77	79	78	78	79	77	73	71	73	68	67	66	65	65	65	60	59	62	65	65	59	79	70	24	
21	64	65	67	67	67	69	71	70	68	58	51	46	43	40	38	38	40	46	50	53	54	54	54	57	38	71	55	24	
22	58	61	64	74	76	77	78	78	77	75	71	67	64	64	61	64	73	79	83	83	80	77	74	67	58	83	72	24	
23	64	63	64	67	68	68	66	61	56	51	46	43	40	40	40	41	46	47	51	54	60	60	57	40	68	55	24		
24	54	57	54	50	49	47	48	46	43	40	38	38	36	32	40	43	42	43	44	41	42	46	54	58	32	58	45	24	
25	62	66	68	68	69	74	83	86	87	88	88	88	89	89	88	87	88	87	84	82	82	83	83	84	62	89	81	24	
26	85	85	85	85	84	83	81	81	80	77	72	71	68	66	65	65	64	67	68	69	71	72	73	74	64	85	75	24	
27	74	75	77	80	81	83	83	80	73	76	72	68	63	60	57	56	59	62	64	65	68	70	71	72	56	83	70	24	
28	73	73	71	72	73	72	68	67	61	55	52	45	34	33	34	39	44	49	52	54	58	61	63	76	33	76	57	24	
29	72	67	60	62	62	63	63	63	67	86	82	73	64	63	63	64	63	64	59	59	60	61	62	63	59	86	65	24	
30	64	65	66	70	73	77	77	74	73	72	69	67	65	66	64	64	66	68	71	72	74	76	77	79	64	79	70	24	
31	80	82	83	85	84	84	84	82	85	87	87	86	85	86	87	87	88	88	88	88	88	88	88	88	80	88	86	24	
HOURLY MAX	87	87	87	89	89	89	89	88	88	88	88	88	88	89	89	88	89	89	89	89	89	89	89	88	88				
HOURLY AVG	70	72	72	73	74	76	76	74	71	70	67	63	60	57	57	57	59	62	65	66	68	69	69	70					

STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

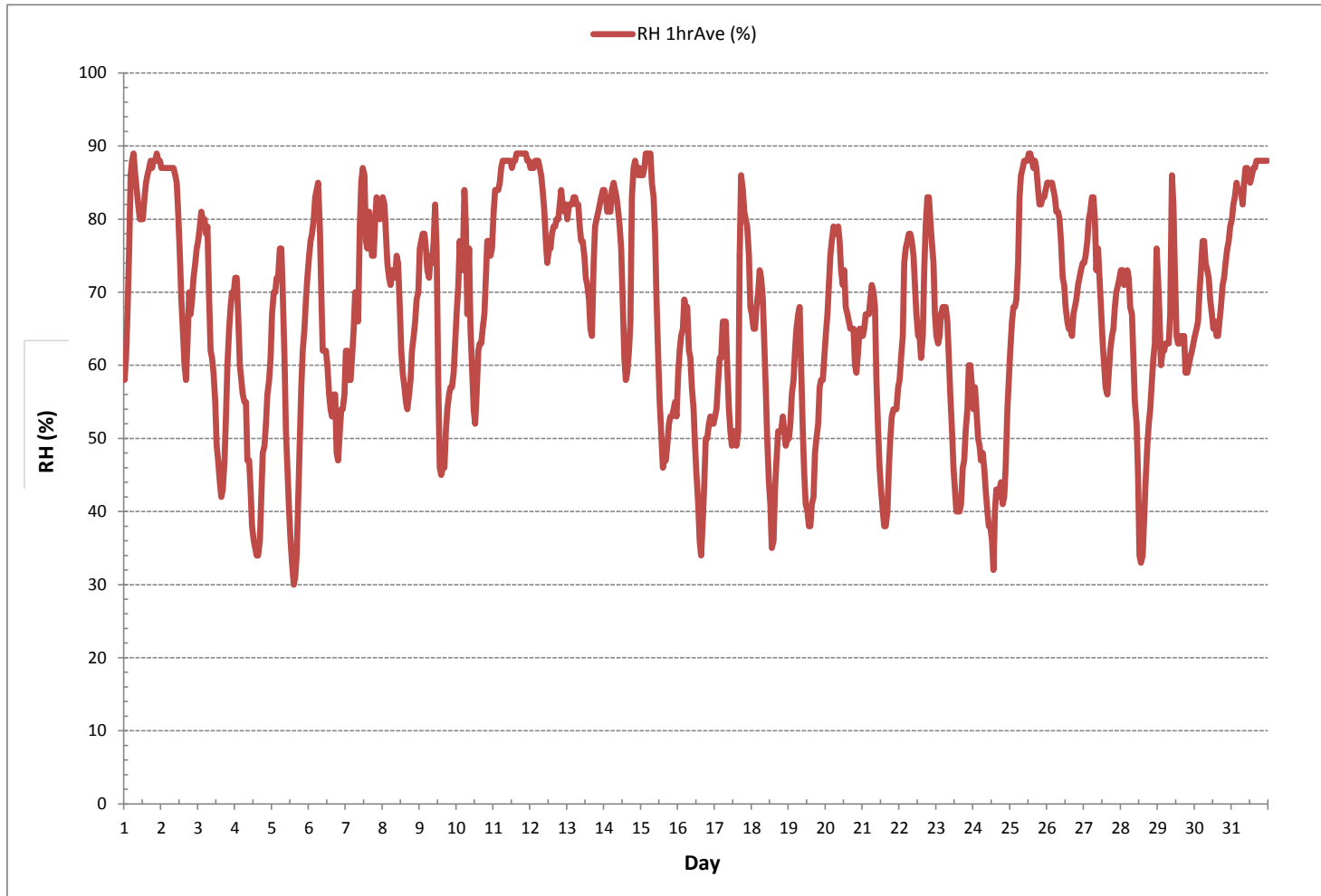
24 HR AVERAGES October 2017



MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	30	%	@ HOUR	14	ON DAY	5
MAXIMUM 1-HR AVERAGE:	89	%	@ HOUR	6	ON DAY	1
MAXIMUM 24-HR AVERAGE:	87	%			ON DAY	11
			OPERATIONAL TIME:			744 hrs
			AMD OPERATION UPTIME:			100.0 %
STANDARD DEVIATION:	15		MONTHLY AVERAGE:			67 %

RELATIVE HUMIDITY Hourly Averages (RH %)



BAROMETRIC PRESSURE



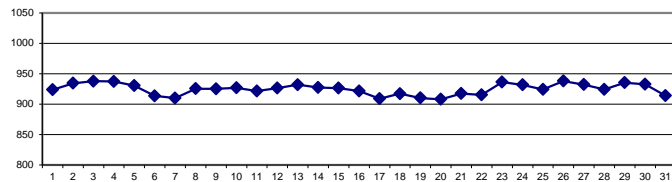
BAROMETRIC PRESSURE Hourly Averages (BP mbar)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.				
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.					
DAY																																
1	920	920	920	920	921	921	921	921	922	922	923	923	924	924	925	925	925	926	926	927	927	927	927	928	920	928	924	24				
2	928	929	929	929	930	931	931	932	932	933	934	934	935	936	936	937	937	938	938	938	939	939	939	939	928	939	934	24				
3	939	939	939	939	940	939	939	939	940	940	940	940	940	939	938	938	937	936	935	934	934	934	934	934	934	940	938	24				
4	934	935	935	935	936	936	936	937	937	938	939	939	940	940	940	939	939	939	938	937	937	936	936	936	934	940	937	24				
5	935	935	934	934	933	933	932	932	933	933	933	933	932	932	931	930	929	928	927	926	925	924	923	922	922	935	930	24				
6	921	921	920	919	919	917	916	915	915	915	915	914	913	913	912	911	910	909	909	908	908	908	908	907	907	921	913	24				
7	907	908	908	908	907	907	906	906	907	907	907	907	908	910	911	912	913	913	913	914	914	915	916	916	906	916	910	24				
8	917	918	919	919	920	921	922	923	924	925	926	927	928	928	929	929	929	929	930	930	930	929	929	929	917	930	925	24				
9	928	928	927	926	926	925	925	924	924	924	924	924	925	925	925	925	925	925	925	925	925	925	926	926	924	928	925	24				
10	926	926	926	926	926	926	926	927	928	928	929	929	929	928	928	927	927	927	927	926	926	925	924	924	924	929	927	24				
11	924	923	922	922	921	921	921	921	921	921	921	921	921	921	921	921	921	921	922	922	922	922	923	923	921	924	922	24				
12	923	923	924	924	924	925	925	926	926	926	927	927	927	927	927	927	928	928	928	928	928	929	929	929	923	929	927	24				
13	930	930	930	930	930	931	931	932	932	933	933	933	933	934	934	934	933	933	933	932	932	932	931	930	930	934	932	24				
14	931	930	930	929	928	928	927	927	926	926	926	926	926	926	926	926	926	926	926	926	927	927	927	928	926	931	927	24				
15	928	929	929	929	929	929	929	929	929	928	928	928	928	927	926	925	925	924	923	923	922	922	922	921	921	929	926	24				
16	921	921	921	922	922	922	923	924	924	925	925	925	924	924	923	923	922	921	920	919	918	918	917	917	917	925	922	24				
17	917	917	916	915	915	914	912	911	910	909	908	907	905	903	902	901	903	904	905	906	908	909	910	912	901	917	909	24				
18	913	915	916	917	917	918	919	919	920	921	921	921	921	921	921	920	919	917	916	914	913	912	911	909	909	921	917	24				
19	908	908	907	907	907	908	908	908	909	911	912	913	913	913	913	913	912	912	911	910	910	909	909	907	907	913	910	24				
20	908	907	906	906	906	906	905	905	906	906	907	907	907	908	909	909	910	911	912	913	913	913	913	905	905	913	908	24				
21	914	914	914	915	916	916	916	917	917	918	919	919	920	920	920	920	920	920	919	918	917	917	916	915	914	920	917	24				
22	914	914	912	911	910	910	909	909	909	910	911	912	913	914	916	917	918	919	920	921	922	923	924	925	909	925	915	24				
23	926	928	929	930	931	932	933	934	936	937	939	939	940	941	941	942	942	941	941	940	939	938	937	936	926	942	936	24				
24	935	934	933	931	931	930	930	931	931	932	932	932	932	933	934	934	933	933	932	931	931	929	928	927	927	935	932	24				
25	925	923	921	920	918	917	915	914	915	915	917	918	921	924	927	929	931	933	934	936	937	939	940	914	914	940	924	24				
26	940	941	941	941	941	941	940	940	940	940	939	938	938	938	937	936	936	935	934	934	934	933	933	933	933	941	938	24				
27	933	934	933	933	933	933	933	933	933	934	934	935	934	934	934	933	933	931	931	930	929	928	927	926	926	935	932	24				
28	925	924	924	923	923	922	922	923	923	924	924	924	924	924	924	924	924	924	925	925	926	926	927	922	922	927	924	24				
29	928	928	929	929	929	930	930	931	932	933	934	935	936	937	938	938	939	940	940	941	941	942	942	942	928	942	935	24				
30	941	941	940	940	939	937	936	935	935	934	934	933	933	931	930	930	929	929	928	927	927	926	925	924	924	941	933	24				
31	923	922	921	919	918	917	916	915	914	914	912	912	911	910	910	910	910	910	910	911	911	912	913	913	910	923	914	24				
HOURLY MAX	941	941	941	941	941	941	940	940	940	940	940	940	940	941	941	942	942	941	941	941	941	942	942	942								
HOURLY AVG	925	925	924	924	924	924	924	924	924	925	925	925	925	925	925	925	925	925	925	925	925	925	925	925								

STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

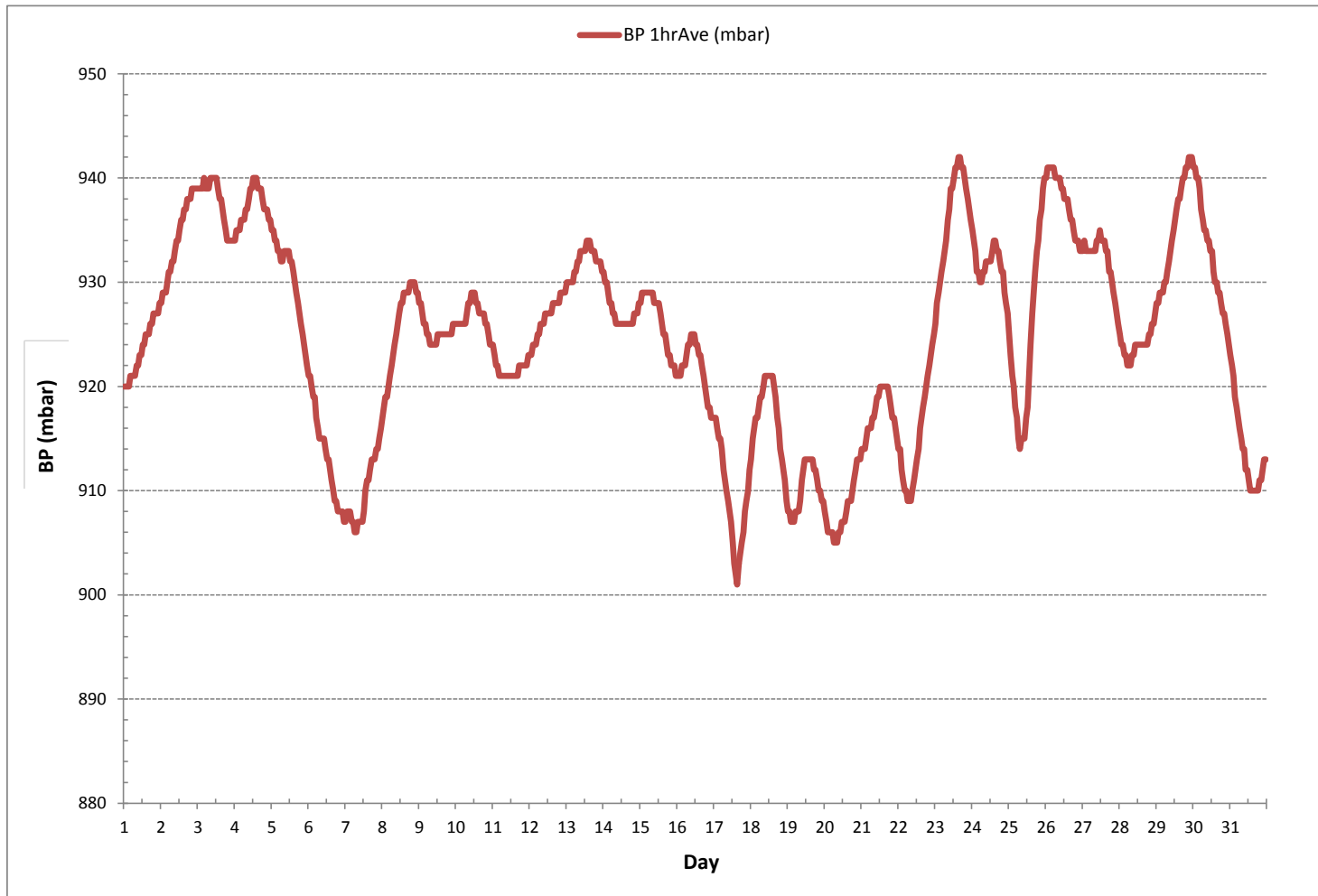
24 HR AVERAGES October 2017



MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	901 mbar	@ HOUR	15	ON DAY	17
MAXIMUM 1-HR AVERAGE:	942 mbar	@ HOUR	15	ON DAY	23
MAXIMUM 24-HR AVERAGE:	938 mbar			ON DAY	26
OPERATIONAL TIME:					744 hrs
AMD OPERATION UPTIME:					100.0 %
STANDARD DEVIATION:	10	MONTHLY AVERAGE:			925 mbar

BAROMETRIC PRESSURE Hourly Averages (BP mbar)



AMBIENT TEMPERATURE



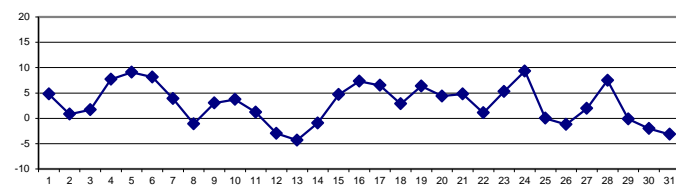
AMBIENT TEMPERATURE Hourly Averages (AmbTPX °C)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.	
DAY																												
1	10.2	9.9	9.4	8.5	7.5	7.3	6.9	6.4	6.4	5.7	5.1	5.0	5.1	4.2	3.7	3.2	2.8	2.5	2.1	0.6	0.4	0.4	0.6	0.8	0.4	10.2	4.8	24
2	1.3	1.3	1.1	0.9	0.6	0.1	-0.2	-0.4	-0.4	-0.1	0.1	0.9	1.9	3.0	3.3	4.1	3.9	2.4	0.9	0.6	-0.3	-1.2	-1.6	-2.2	-2.2	4.1	0.8	24
3	-2.8	-3.0	-3.4	-3.4	-3.6	-3.5	-3.5	-0.9	1.8	3.4	4.0	4.9	6.2	7.0	7.9	8.2	7.4	5.4	3.5	2.0	0.7	0.6	0.9	1.2	-3.6	8.2	1.7	24
4	0.6	0.4	1.4	2.6	2.5	2.8	3.3	4.1	7.1	9.1	11.6	13.0	14.3	14.6	14.9	14.7	13.8	11.2	8.7	8.4	7.8	6.8	6.2	5.2	0.4	14.9	7.7	24
5	4.0	3.6	3.3	2.7	2.3	2.0	2.0	3.5	6.5	9.7	11.9	14.4	16.0	17.0	17.8	17.7	16.5	14.2	12.1	10.4	9.0	8.0	7.2	6.5	2.0	17.8	9.1	24
6	5.6	4.9	4.7	4.0	3.4	2.9	2.3	3.3	6.5	9.8	9.7	10.4	11.0	12.0	11.9	12.8	12.2	11.7	11.6	10.6	9.4	8.5	8.2	7.8	2.3	12.8	8.1	24
7	6.6	7.1	7.1	6.5	4.7	3.3	2.2	2.6	3.9	2.9	2.1	1.3	3.5	5.1	5.4	4.6	5.2	4.8	4.1	3.7	2.4	2.1	1.4	0.6	0.6	7.1	3.9	24
8	-0.3	-0.8	-1.3	-1.7	-2.0	-1.8	-2.0	-2.0	-1.4	-1.8	-1.3	-0.9	0.1	0.4	0.6	0.5	0.4	-0.2	-0.9	-1.2	-1.4	-1.7	-2.7	-3.1	-3.1	0.6	-1.1	24
9	-3.9	-4.5	-4.5	-4.4	-3.8	-2.9	-2.6	-2.4	-1.2	0.2	2.4	4.7	9.4	11.1	10.8	10.3	10.2	8.1	7.4	6.7	6.1	5.8	5.2	4.1	-4.5	11.1	3.0	24
10	2.8	1.9	0.6	1.0	0.9	-1.1	-0.2	2.0	1.6	5.1	6.7	7.2	7.9	7.4	6.6	5.8	5.4	4.9	4.6	4.1	3.4	3.6	3.5	3.6	-1.1	7.9	3.7	24
11	3.2	2.7	2.6	2.5	2.3	2.1	2.0	2.2	2.6	3.0	3.1	1.8	1.3	0.3	0.9	0.8	0.6	0.3	0.0	-0.5	-0.9	-1.2	-1.5	-1.9	-1.9	3.2	1.2	24
12	-2.3	-2.6	-2.8	-2.9	-3.1	-3.3	-3.6	-3.9	-3.9	-3.5	-3.0	-2.2	-2.3	-2.4	-2.7	-2.8	-2.8	-2.7	-2.6	-2.7	-2.8	-3.4	-3.7	-3.6	-3.9	-2.2	-3.0	24
13	-3.8	-3.9	-4.3	-4.6	-4.9	-5.1	-5.2	-5.0	-4.7	-4.4	-4.0	-3.8	-3.4	-2.9	-2.4	-1.1	-1.0	-3.9	-5.4	-5.9	-6.2	-6.2	-6.0	-5.9	-6.2	-1.0	-4.3	24
14	-5.9	-5.6	-5.2	-4.9	-4.8	-5.4	-4.8	-4.1	-3.2	-2.1	-1.4	-0.3	2.4	4.2	4.5	4.0	3.3	3.0	1.6	0.7	0.6	0.6	0.5	0.1	-5.9	4.5	-0.9	24
15	0.0	-0.2	-1.0	-1.5	-1.7	-2.3	-2.7	-1.5	-0.4	1.6	4.4	6.6	8.5	8.9	10.7	10.7	11.0	10.2	9.3	9.0	8.6	8.2	7.6	8.0	-2.7	11.0	4.7	24
16	6.2	4.9	4.2	3.7	2.8	3.3	3.8	5.4	5.9	8.1	8.6	9.5	10.1	10.9	12.0	12.1	10.6	9.6	8.5	7.9	7.4	7.2	6.9	6.4	2.8	12.1	7.3	24
17	5.9	5.3	4.3	3.7	3.8	2.7	3.2	3.6	6.2	9.1	11.0	12.5	12.3	12.7	13.4	12.9	8.1	5.3	5.2	4.8	3.3	2.9	2.1	1.7	1.7	13.4	6.5	24
18	1.7	1.4	0.8	0.7	0.6	0.2	0.0	0.3	1.7	3.1	4.3	5.3	6.1	7.1	6.5	5.3	4.3	3.1	3.0	3.0	2.6	2.8	2.4	2.0	0.0	7.1	2.8	24
19	2.1	1.8	1.1	1.0	0.3	0.1	0.0	0.2	3.2	7.1	9.9	11.5	12.3	13.4	13.2	12.7	11.3	9.5	8.9	8.3	6.9	6.6	6.3	5.3	0.0	13.4	6.4	24
20	4.6	3.7	3.0	2.2	1.8	1.4	1.9	2.2	2.0	3.1	4.5	4.8	4.4	5.7	6.0	6.1	6.2	6.0	6.0	6.6	6.6	5.9	5.5	4.9	1.4	6.6	4.4	24
21	4.5	3.9	3.4	3.2	2.8	2.1	1.4	1.2	1.9	4.8	7.1	8.5	9.0	9.4	9.9	9.9	8.5	5.8	4.2	3.3	3.1	2.7	2.6	2.2	1.2	9.9	4.8	24
22	2.2	1.8	1.1	-1.6	-2.5	-2.6	-2.6	-1.9	-0.9	0.7	1.9	2.8	2.5	2.9	2.8	2.6	1.8	1.5	1.5	2.3	3.5	4.0	4.8	-2.6	4.8	1.1	24	
23	4.7	4.3	3.8	2.5	2.0	1.9	1.8	2.7	4.4	6.2	7.8	8.8	9.3	10.1	9.7	9.4	8.5	6.2	5.5	4.4	3.5	2.5	2.7	3.4	1.8	10.1	5.3	24
24	3.8	3.7	4.1	4.5	5.2	6.6	7.4	9.3	12.2	14.6	15.6	15.8	15.9	15.8	13.6	12.2	11.1	10.3	9.4	8.7	7.9	6.6	5.0	4.2	3.7	15.9	9.3	24
25	3.6	2.8	2.5	2.3	2.0	1.4	0.5	0.2	0.2	-0.1	-0.5	-0.6	-0.6	-0.7	-0.6	-0.8	-1.0	-1.2	-1.3	-1.5	-1.6	-1.6	-1.7	-1.7	-1.7	3.6	0.0	24
26	-2.1	-2.3	-2.3	-2.3	-2.5	-2.7	-3.3	-3.6	-3.2	-2.4	-1.0	-0.4	0.5	0.9	1.0	1.2	1.2	0.4	-0.1	-0.5	-1.2	-1.5	-1.8	-1.6	-3.6	1.2	-1.2	24
27	-1.4	-1.3	-1.5	-2.0	-2.1	-2.4	-2.4	-1.4	0.8	0.3	2.2	3.4	5.2	6.2	6.8	6.8	6.1	5.0	4.3	4.0	3.2	2.6	2.2	2.1	-2.4	6.8	1.9	24
28	2.2	2.8	4.1	3.8	3.9	4.7	6.5	7.0	9.1	12.0	13.0	13.5	13.8	13.3	12.7	10.7	9.1	7.6	6.6	6.2	5.5	4.6	4.3	2.3	2.2	13.8	7.5	24
29	1.6	1.6	1.5	1.3	1.1	0.7	0.7	0.5	0.2	-1.7	-0.9	0.3	0.3	0.3	0.0	-0.1	-0.7	-1.1	-1.1	-1.3	-1.4	-1.6	-1.7	-2.0	-2.0	1.6	-0.1	24
30	-2.4	-2.7	-2.7	-3.1	-4.0	-4.9	-5.0	-4.5	-3.5	-2.7	-1.4	-0.7	-0.1	0.0	0.7	0.9	0.4	-0.3	-1.1	-1.4	-1.8	-2.1	-2.7	-3.2	-5.0	0.9	-2.0	24
31	-3.5	-3.8	-4.1	-4.4	-4.4	-4.2	-3.9	-3.7	-3.7	-3.2	-2.5	-1.6	-1.3	-1.7	-1.9	-2.0	-2.6	-2.9	-3.1	-3.2	-3.4	-3.5	-3.6	-3.5	-4.4	-1.3	-3.2	24
HOURLY MAX	10.2	9.9	9.4	8.5	7.5	7.3	7.4	9.3	12.2	14.6	15.6	15.8	16.0	17.0	17.8	17.7	16.5	14.2	12.1	10.6	9.4	8.5	8.2	8.0				
HOURLY AVG	1.6	1.3	1.0	0.7	0.4	0.1	0.1	0.7	1.8	3.1	4.2	5.0	5.9	6.3	6.4	6.2	5.6	4.4	3.7	3.1	2.6	2.2	1.9	1.6				

STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

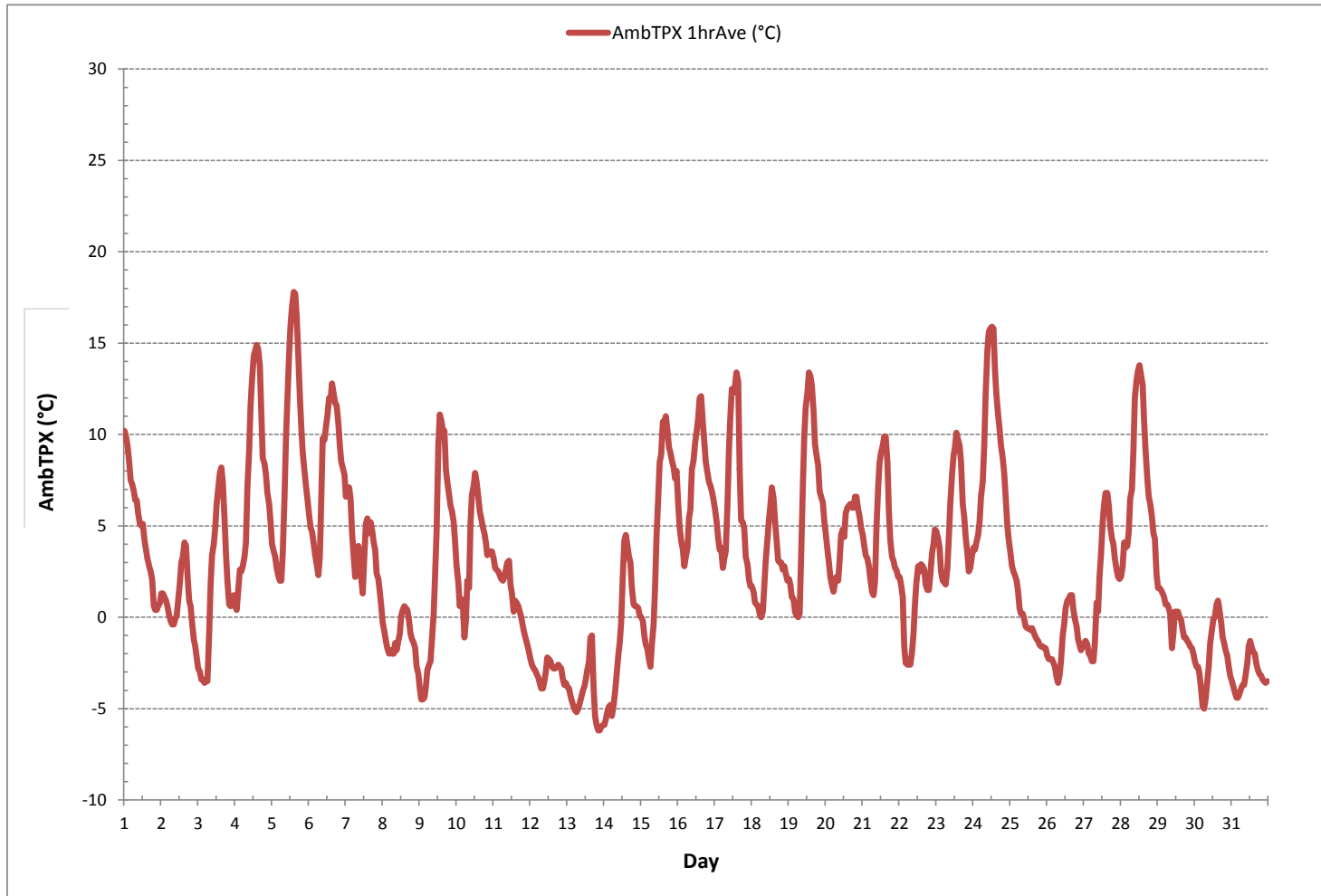
24 HR AVERAGES October 2017



MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	-6.2 °C	@ HOUR	20	ON DAY	13
MAXIMUM 1-HR AVERAGE:	17.8 °C	@ HOUR	14	ON DAY	5
MAXIMUM 24-HR AVERAGE:	9.3 °C			ON DAY	24
OPERATIONAL TIME:				744 hrs	
AMD OPERATION UPTIME:				100.0 %	
STANDARD DEVIATION:	4.9			MONTHLY AVERAGE:	2.9 °C

AMBIENT TEMPERATURE Hourly Averages (AmbTPX °C)



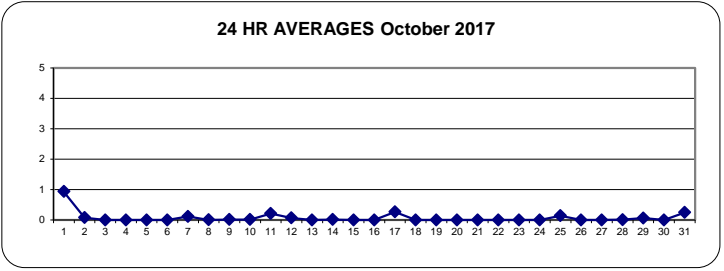
PRECIPITATION

PRECIPITATION Hourly Averages (mm)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.		
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.			
DAY																														
1	0.0	0.0	0.0	0.0	0.2	0.3	1.4	0.1	0.0	0.3	0.6	0.3	0.0	1.4	0.7	1.4	1.5	0.8	2.9	2.8	1.1	2.9	2.1	1.6	0.0	2.9	0.9	24		
2	0.1	0.2	0.3	0.3	0.3	0.1	0.2	0.2	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.1	24	
3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	
4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	
6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	
7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.7	1.0	0.2	0.0	0.1	0.1	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.1	24	
8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	24	
9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	24	
10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	24	
11	0.2	0.3	0.0	0.0	0.0	0.3	0.5	0.0	0.0	0.0	0.0	0.1	0.7	1.8	0.0	0.0	0.3	0.3	0.3	0.1	0.1	0.1	0.1	0.0	0.0	1.8	0.2	24		
12	0.1	0.1	0.3	0.5	0.2	0.1	0.0	0.0	0.0	0.0	0.1	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.1	24	
13	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	
14	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	24	
15	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	
16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	
17	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.8	3.7	0.6	0.0	0.1	0.0	0.1	0.0	0.0	3.7	0.3	24		
18	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	
19	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	
20	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	
21	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	
22	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	
23	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	
24	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	
25	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.4	0.1	0.0	0.0	0.3	0.3	1.0	0.6	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.1	24	
26	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	
27	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	
28	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	24	
29	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	1.1	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	0.1	24	
30	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	
31	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.8	0.4	0.1	0.1	0.0	0.5	0.6	0.6	0.4	0.8	0.4	0.3	0.3	0.2	0.3	0.0	0.8	0.2	24		
HOURLY MAX	0.2	0.3	0.3	0.5	0.3	0.3	1.4	0.4	0.1	1.1	0.7	1.0	0.7	1.8	0.7	1.4	1.8	3.7	2.9	2.8	1.1	2.9	2.1	1.6						
HOURLY AVG	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1						

STATUS FLAG CODES

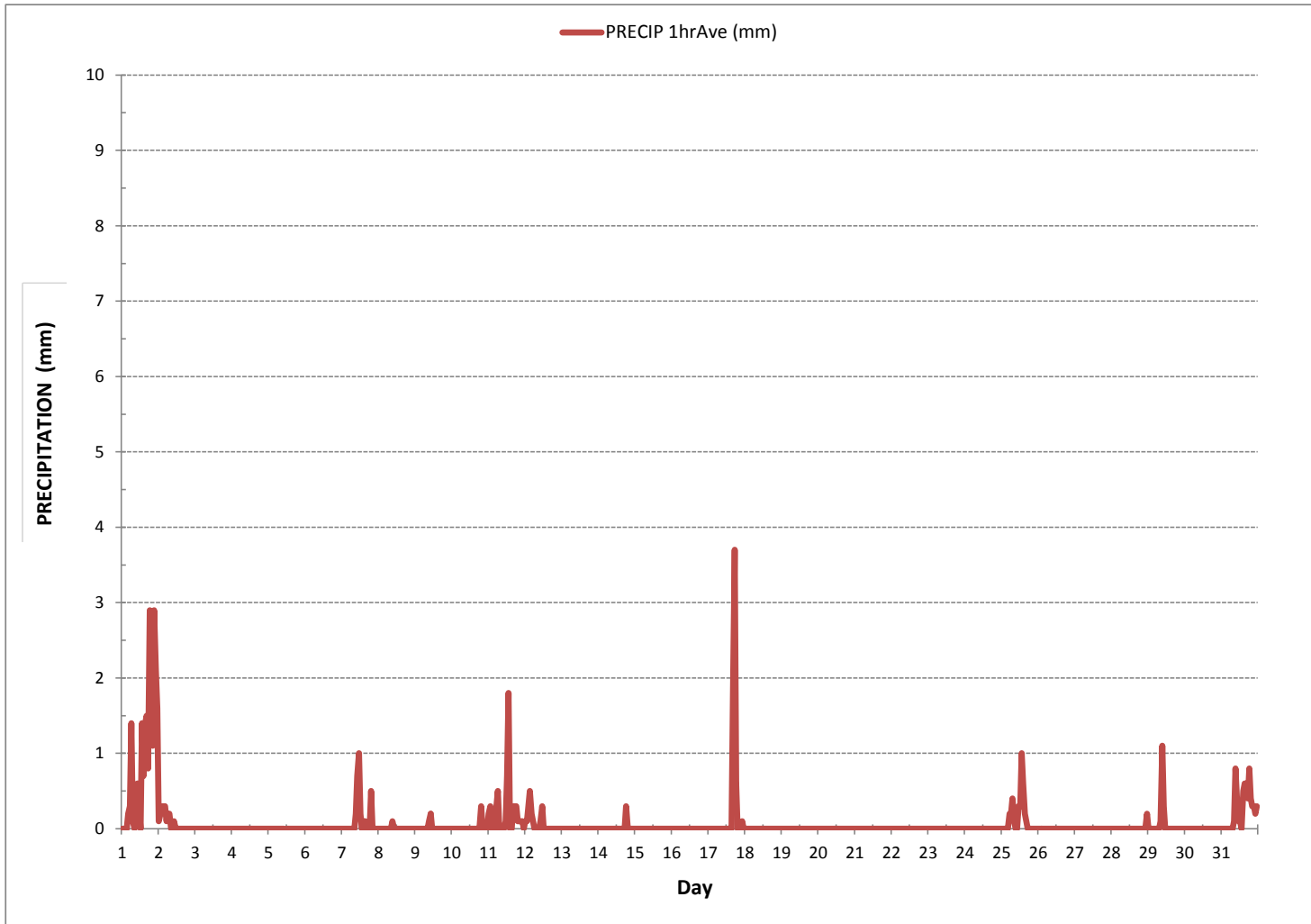
C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE



MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	0.0	mm	@ HOUR	0	ON DAY	1
MAXIMUM 1-HR AVERAGE:	3.7	mm	@ HOUR	17	ON DAY	17
MAXIMUM 24-HR AVERAGE:	0.9	mm			ON DAY	1
MONTHLY TOTAL	52.2	mm				
OPERATIONAL TIME:						744 hrs
AMD OPERATION UPTIME:						100.0 %
STANDARD DEVIATION:	0.3					
MONTHLY AVERAGE:						0.1 mm

PRECIPITATION Hourly Averages (mm)



***APPENDIX II
EQUIPMENT CALIBRATION RESULTS***

SULPHUR DIOXIDE



API 100E Sulphur Dioxide Analyzer Calibration

Date:	October 4, 2017	Barometer/B.P./units:	F.S. 05544 expires December 5, 2018	939	millibars
Company/Airshed:	LICA	Thermometer/Station Temp:	F.S. 170286131 expires April 19, 2019	20	°C
Location/Station Name:	St. Lina	Weather Conditions:	Mainly sunny		
Parameter:	Sulphur Dioxide	Calibration Purpose:	routine monthly		
Start Time 24 hr. (mst):	11:22	Performed By/Reviewer:	Alex Yakupov	Tom Bourque	
End Time 24 hr. (mst):	15:42	Cal Gas Expiry Date:	July 18, 2019		
Calibration Method:	Gas Dilution	Converter Model & s/n (if applicable):	n/a		

Analyzer:	Range ppb:
ID# or Serial Number:	468
Last Calibration Date:	September 7, 2017
Previous C.F.:	0.998
	As Found C.F.:
	0.995
	New C.F.:
	1.000

Calibration Standards:	Standard Calibration Points for Ranges
Low Flow Meter ID/Expiry Date:	Defender Low 152020 expires November 21, 2017
High Flow Meter ID/Expiry Date:	Defender High 148943 expires November 21, 2017
Calibrator ID/Expiry Date:	API id# 627 expires January 27, 2018
Cal Gas Cylinder I.D. # :	LL 104222
Cal Gas Conc. (ppm):	50.6

Point	ppb
High	780
Mid	380
Low	190

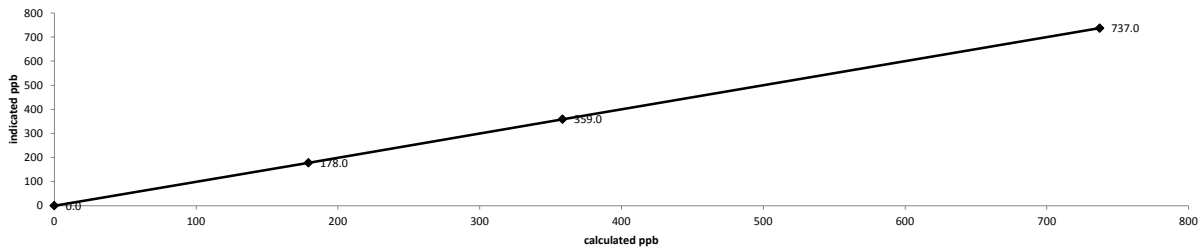
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Point	Calibrator Flow Rates (cc/min)			Calculated Concentration (ppb):	Indicated Concentration (ppb):	Correction Factors (C.F.):
	Diluent	Cal Gas	Total			
as found zero	5179	0.00	5179	0.0	0.0	n/a
as found high	5242	77.52	5320	737.3	741.0	0.995
adjusted zero	5179	0.00	5179	0.0	0.0	n/a
adjusted high	5242	77.52	5320	737.3	737.0	1.000
mid	5269	37.60	5307	358.5	359.0	0.999
low	5277	18.76	5296	179.2	178.0	1.007
calibrator zero	5179	0.00	5179	0.0	0.0	n/a
Average C.F. =						1.002

Linear Regression/Calibration Results:

	LIMITS
Correlation Coefficient =	1.000 > or = 0.995
Slope =	1.000 0.95-1.05
b (Intercept as % of full scale) =	0.03% ± 3% F.S.
% change in C.F. from last cal =	0.30% ± 10%

API 100E Sulphur Dioxide Analyzer Calibration



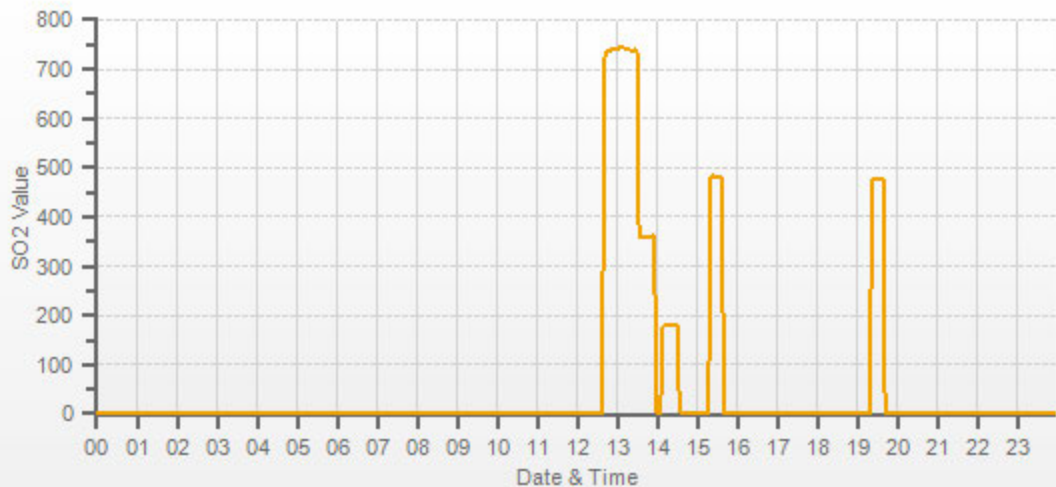
	As found:		As left:
Slope:	0.938	Slope:	0.930
Offset:	137.4	Offset:	137.4
Hvps:	651	Hvps:	651
Rcell Temp:	50.0	Rcell Temp:	50.0
Box Temp:	29.4	Box Temp:	29.7
Pmt Temp:	7.9	Pmt Temp:	7.9
Izs Temp:	45.0	Izs Temp:	45.0
Pres:	24.2	Pres:	24.2
Samp Fl:	614	Samp Fl:	613
Norm Pmt:	136.3	Norm Pmt:	139.4
Uv Lamp:	2964.1	Uv Lamp:	2956.1
Lamp Ratio:	94.2	Lamp Ratio:	94.3
Str Lgt:	64.4	Str Lgt:	63.9
Drk Pmt:	5.4	Drk Pmt:	5.9
Expected Value:	500.0	Expected Value:	479.0

Comments:

The analyzer sample inlet filter was changed.
 The manifold blower was found to be working normally.
 No zero adjustment was required/made.

Flow measurement after mid-point.

SO2[ppb] Station: LICA ST. LINA Daily: 17/10/04 Type: AVG 1 Min. [1 Min.]



— SO2[ppb]

HYDROGEN SULPHIDE



API 101E Hydrogen Sulphide Analyzer Calibration

Date: <u>October 4, 2017</u>	Barometer/B.P./units: <u>F.S. 05544 expires December 5, 2018</u> <u>939</u> millibars
Company/Airshed: <u>LICA</u>	Thermometer/Station Temp: <u>F.S. 170286131 expires April 19, 2019</u> <u>20</u> °C
Location/Station Name: <u>St. Lina</u>	Weather Conditions: <u>Mainly sunny</u>
Parameter: <u>Hydrogen Sulphide</u>	Calibration Purpose: <u>routine monthly</u>
Start Time 24 hr. (mst): <u>11:22</u>	Performed By/Reviewer: <u>Alex Yakupov</u> <u>Tom Bourque</u>
End Time 24 hr. (mst): <u>15:01</u>	Cal Gas Expiry Date: <u>June 14, 2019</u>
Calibration Method: <u>Gas Dilution</u>	Converter Model & s/n (if applicable): <u>n/a</u>

Analyzer:	Range ppb: <u>100</u>
ID# or Serial Number: <u>509</u>	As Found C.F.: <u>0.968</u>
Last Calibration Date: <u>September 7, 2017</u>	New C.F.: <u>1.000</u>
Previous C.F.: <u>1.000</u>	

Calibration Standards:	Standard Calibration Points for Ranges								
Low Flow Meter ID/Expiry Date: <u>Defender Low 152020 expires November 21, 2017</u>	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><th>Point</th><th>ppb</th></tr> <tr><td>High</td><td>78</td></tr> <tr><td>Mid</td><td>38</td></tr> <tr><td>Low</td><td>19</td></tr> </table>	Point	ppb	High	78	Mid	38	Low	19
Point		ppb							
High		78							
Mid		38							
Low	19								
High Flow Meter ID/Expiry Date: <u>Defender High 148943 expires November 21, 2017</u>									
Calibrator ID/Expiry Date: <u>Sabio id# 11900613 expires March 16, 2018</u>									
Cal Gas Cylinder I.D. #: <u>EY 0000654</u>									
Cal Gas Conc. (ppm): <u>10.2</u>									

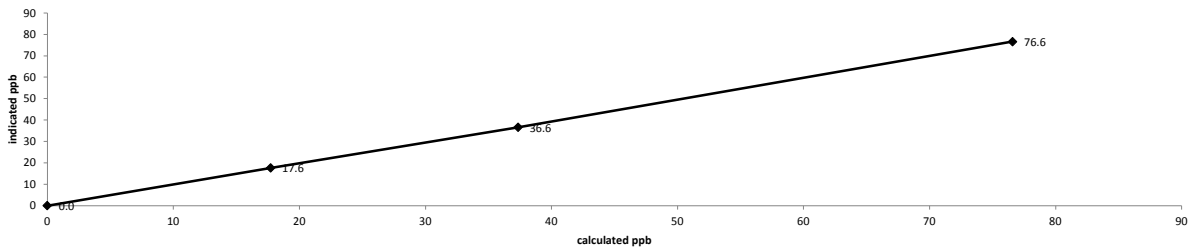
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Calibrator Flow Rates (cc/min)				Calculated	Indicated Concentration (ppb):	Correction Factors (C.F.):
Point	Diluent	Cal Gas	Total	Concentration (ppb):		
as found zero	7905	0.00	7905	0.0	0.0	n/a
as found high	7837	59.29	7896	76.6	79.1	0.968
adjusted zero	7905	0.00	7905	0.0	0.0	n/a
adjusted high	7837	59.29	7896	76.6	76.6	1.000
mid	7919	29.11	7948	37.4	36.6	1.021
low	7929	13.80	7943	17.7	17.6	1.007
calibrator zero	7905	0.00	7905	0.0	0.0	n/a
Average C.F. =						1.009

Linear Regression/Calibration Results:

	LIMITS
Correlation Coefficient = <u>1.000</u>	> or = 0.995
Slope = <u>1.000</u>	0.95-1.05
b (Intercept as % of full scale) = <u>0.21%</u>	± 3% F.S.
% change in C.F. from last cal = <u>3.17%</u>	± 10%

API 101E Hydrogen Sulphide Analyzer Calibration

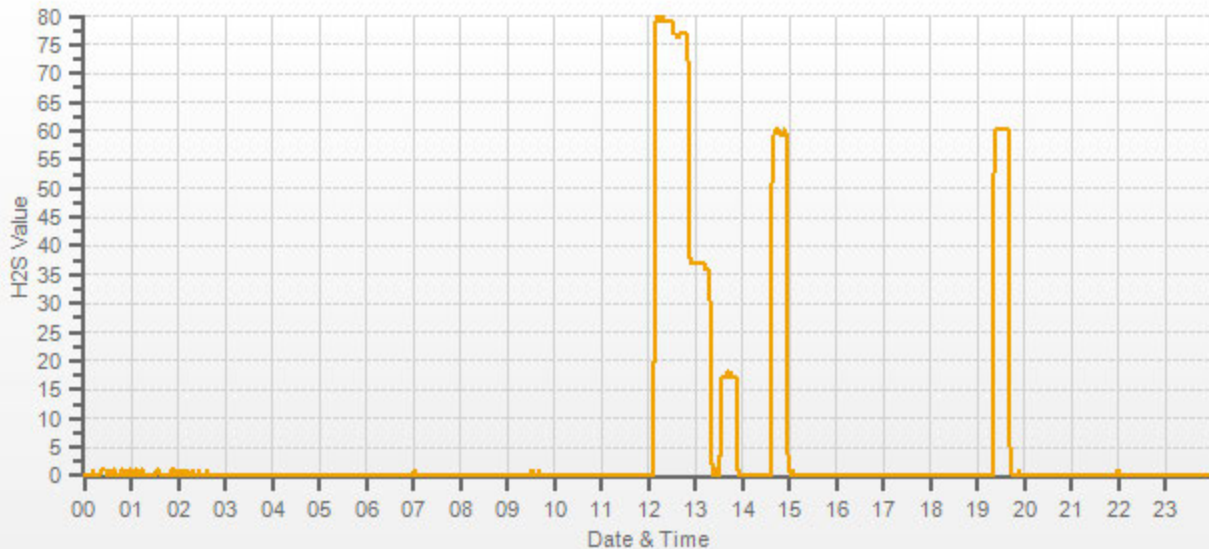


<p style="text-align: center;">As found:</p> Slope: <u>0.921</u> Offset: <u>65.7</u> Hvps: <u>671</u> Rcell Temp: <u>50.0</u> Box Temp: <u>28.2</u> Pmt Temp: <u>8.0</u> Izs Temp: <u>48.0</u> Converter Temp: <u>315.7</u> Pres: <u>20.7</u> Samp Fl: <u>533</u> Uv Lamp: <u>3333.0</u> Lamp Ratio: <u>99.4</u> Str Lgt: <u>30.3</u> Drk Pmt: <u>0.5</u> Expected Value: <u>62.5</u>	<p style="text-align: center;">As left:</p> Slope: <u>0.899</u> Offset: <u>65.7</u> Hvps: <u>671</u> Rcell Temp: <u>50.0</u> Box Temp: <u>31.3</u> Pmt Temp: <u>8.0</u> Izs Temp: <u>48.0</u> Converter Temp: <u>313.8</u> Pres: <u>20.6</u> Samp Fl: <u>530</u> Uv Lamp: <u>3327.7</u> Lamp Ratio: <u>99.2</u> Str Lgt: <u>29.5</u> Drk Pmt: <u>0.6</u> Expected Value: <u>59.0</u>
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Comments:

The analyzer sample inlet filter was changed.
The manifold blower was found to be working normally.
No zero adjustment was required/made.

Flow measurement after mid-point.



— H2S[ppb]



API 101E Hydrogen Sulphide Analyzer Calibration

Date: <u>October 20, 2017</u>	Barometer/B.P./units: <u>F.S. 05544 expires December 5, 2018</u>	<u>909</u>	millibars
Company/Airshed: <u>LICA</u>	Thermometer/Station Temp: <u>F.S. 170286131 expires April 19, 2019</u>	<u>22</u>	°C
Location/Station Name: <u>St. Lina</u>	Weather Conditions: <u>Cloudy/Overcast</u>		
Parameter: <u>Hydrogen Sulphide</u>	Calibration Purpose: <u>repeat</u>		
Start Time 24 hr. (mst): <u>16:38</u>	Performed By/Reviewer: <u>Alex Yakupov</u>		<u>Tom Bourque</u>
End Time 24 hr. (mst): <u>20:56</u>	Cal Gas Expiry Date: <u>June 14, 2019</u>		
Calibration Method: <u>Gas Dilution</u>	Converter Model & s/n (if applicable): <u>n/a</u>		

Analyzer:	ID# or Serial Number: <u>509</u>	Range ppb: <u>100</u>	
	Last Calibration Date: <u>October 4, 2017</u>	As Found C.F.: <u>0.975</u>	
	Previous C.F.: <u>1.000</u>	New C.F.: <u>1.001</u>	

Calibration Standards:	Standard Calibration Points for Ranges								
Low Flow Meter ID/Expiry Date: <u>Defender Low 152020 expires November 21, 2017</u>	<table border="1" style="margin: auto;"> <tr><th>Point</th><th>ppb</th></tr> <tr><td>High</td><td>78</td></tr> <tr><td>Mid</td><td>38</td></tr> <tr><td>Low</td><td>19</td></tr> </table>	Point	ppb	High	78	Mid	38	Low	19
Point	ppb								
High	78								
Mid	38								
Low	19								
High Flow Meter ID/Expiry Date: <u>Defender High 148943 expires November 21, 2017</u>									
Calibrator ID/Expiry Date: <u>Sabio id# 11900613 expires March 16, 2018</u>									
Cal Gas Cylinder I.D. #: <u>EY 0000654</u>									
Cal Gas Conc. (ppm): <u>10.2</u>									

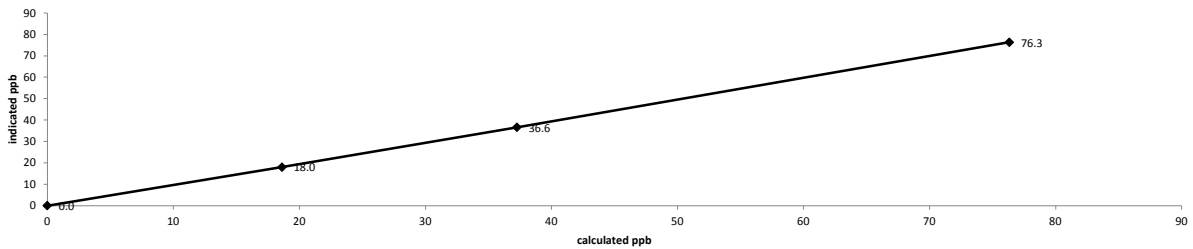
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Calibrator Flow Rates (cc/min)				Calculated	Indicated Concentration (ppb):	Correction Factors (C.F.):
Point	Diluent	Cal Gas	Total	Concentration (ppb):		
as found zero	7831	0.00	7831	0.0	1.7	n/a
as found high	7774	58.93	7833	76.7	80.4	0.975
adjusted zero	7885	0.00	7885	0.0	0.0	n/a
adjusted high	7823	58.99	7882	76.3	76.3	1.001
mid	7850	28.79	7879	37.3	36.6	1.018
low	7859	14.38	7873	18.6	18.0	1.035
calibrator zero	7885	0.00	7885	0.0	0.0	n/a
Average C.F. =						1.018

Linear Regression/Calibration Results:

	LIMITS
Correlation Coefficient = <u>1.000</u>	> or = 0.995
Slope = <u>0.998</u>	0.95-1.05
b (Intercept as % of full scale) = <u>0.39%</u>	± 3% F.S.
% change in C.F. from last cal = <u>2.49%</u>	± 10%

API 101E Hydrogen Sulphide Analyzer Calibration



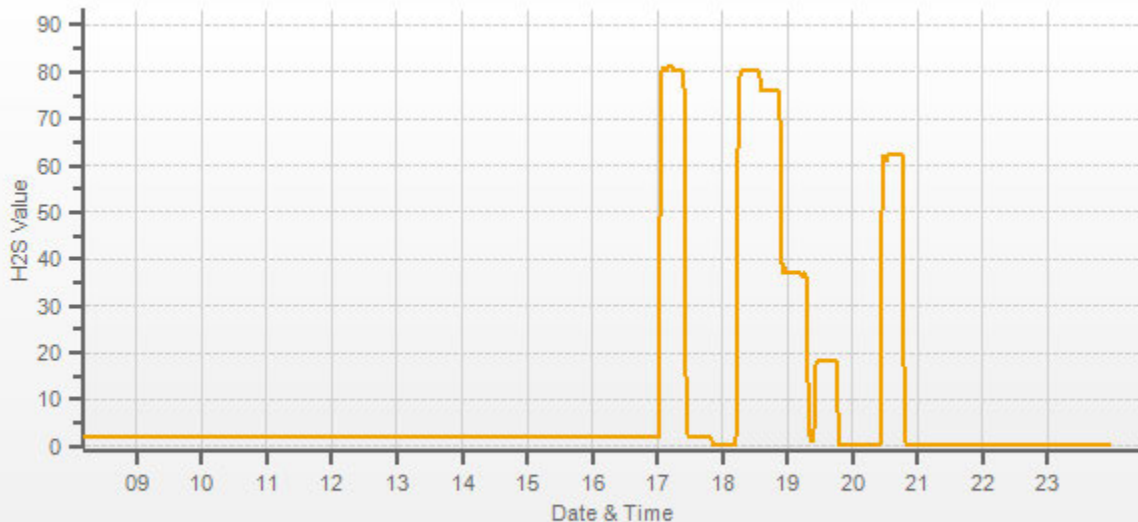
	As found:		As left:
Slope: <u>0.899</u>		Slope: <u>0.895</u>	
Offset: <u>65.7</u>		Offset: <u>70.0</u>	
Hvps: <u>671</u>		Hvps: <u>671</u>	
Rcell Temp: <u>50.0</u>		Rcell Temp: <u>50.0</u>	
Box Temp: <u>31.3</u>		Box Temp: <u>32.1</u>	
Pmt Temp: <u>8.0</u>		Pmt Temp: <u>8.0</u>	
Izs Temp: <u>48.0</u>		Izs Temp: <u>48.0</u>	
Converter Temp: <u>315.5</u>		Converter Temp: <u>314.8</u>	
Pres: <u>19.8</u>		Pres: <u>19.9</u>	
Samp Fl: <u>513</u>		Samp Fl: <u>514</u>	
Uv Lamp: <u>3354.4</u>		Uv Lamp: <u>3353.8</u>	
Lamp Ratio: <u>100.0</u>		Lamp Ratio: <u>100.0</u>	
Str Lgt: <u>29.5</u>		Str Lgt: <u>31.3</u>	
Drk Pmt: <u>0.5</u>		Drk Pmt: <u>0.6</u>	
Expected Value: <u>59.0</u>		Expected Value: <u>62.3</u>	

Comments:

The manifold blower was found to be working normally.

Repeat calibration was completed to correct Zero drift and because SPAN check was over 10%. As Found points for ZERO and High point were performed prior to adjustment. The SO2 scrubber check was performed during the previous calibration earlier in October.

Flow measurement after mid-point.



— H2S[ppb]



API 101E Hydrogen Sulphide Analyzer Calibration

Date: <u>October 26, 2017</u>	Barometer/B.P./units: <u>Brunton 05535 expires December 5, 2017</u>	<u>946</u>	millibars
Company/Airshed: <u>LICA</u>	Thermometer/Station Temp: <u>F.S. 160459244 expires May 18, 2018</u>	<u>22</u>	°C
Location/Station Name: <u>St Lina</u>	Weather Conditions: <u>Mainly clear</u>		
Parameter: <u>Hydrogen Sulphide</u>	Calibration Purpose: <u>repeat</u>		
Start Time 24 hr. (mst): <u>8:48</u>	Performed By/Reviewer: <u>Chris Wesson</u>	<u>Tom Bourque</u>	
End Time 24 hr. (mst): <u>12:20</u>	Cal Gas Expiry Date: <u>May 16, 2020</u>		
Calibration Method: <u>Gas Dilution</u>	Converter Model & s/n (if applicable): <u>Internal</u>		

Analyzer:	ID# or Serial Number: <u>509</u>	Range ppb: <u>100</u>	
	Last Calibration Date: <u>October 20, 2017</u>	As Found C.F.: <u>1.023</u>	
	Previous C.F.: <u>1.001</u>	New C.F.: <u>0.998</u>	

Calibration Standards: Low Flow Meter ID/Expiry Date: <u>Defender Low 153358 expires January 19, 2018</u> High Flow Meter ID/Expiry Date: <u>Defender High 152571 expires January 19, 2018</u> Calibrator ID/Expiry Date: <u>API id# 830 expires February 14, 2018</u> Cal Gas Cylinder I.D. #: <u>LL119420</u> Cal Gas Conc. (ppm): <u>10.2</u>	Standard Calibration Points for Ranges <table border="1" style="margin: auto;"> <tr><th>Point</th><th>ppb</th></tr> <tr><td>High</td><td>78</td></tr> <tr><td>Mid</td><td>38</td></tr> <tr><td>Low</td><td>19</td></tr> </table>	Point	ppb	High	78	Mid	38	Low	19
Point	ppb								
High	78								
Mid	38								
Low	19								

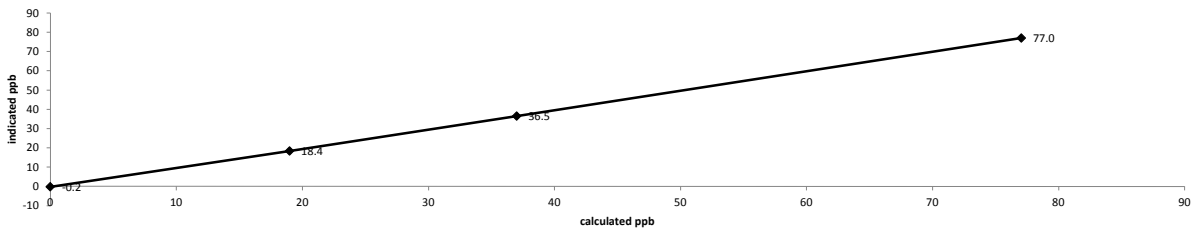
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Calibrator Flow Rates (cc/min)				Calculated	Indicated Concentration (ppb):	Correction Factors (C.F.):
Point	Diluent	Cal Gas	Total	Concentration (ppb):		
as found zero	7522	0.00	7522	0.0	-1.8	n/a
as found high	7449	56.70	7506	77.1	73.5	1.023
adjusted zero	7522	0.00	7522	0.0	-0.2	n/a
adjusted high	7449	56.70	7506	77.1	77.0	0.998
mid	7483	27.25	7510	37.0	36.5	1.008
low	7481	13.96	7495	19.0	18.4	1.021
calibrator zero	7522	0.00	7522	0.0	0.0	n/a
Average C.F. =						1.009

Linear Regression/Calibration Results:

Correlation Coefficient =	<u>1.000</u>	LIMITS	<u>> or = 0.995</u>
Slope =	<u>0.997</u>	0.95-1.05	
b (Intercept as % of full scale) =	<u>0.45%</u>	± 3% F.S.	
% change in C.F. from last cal =	<u>-2.22%</u>	± 10%	

API 101E Hydrogen Sulphide Analyzer Calibration

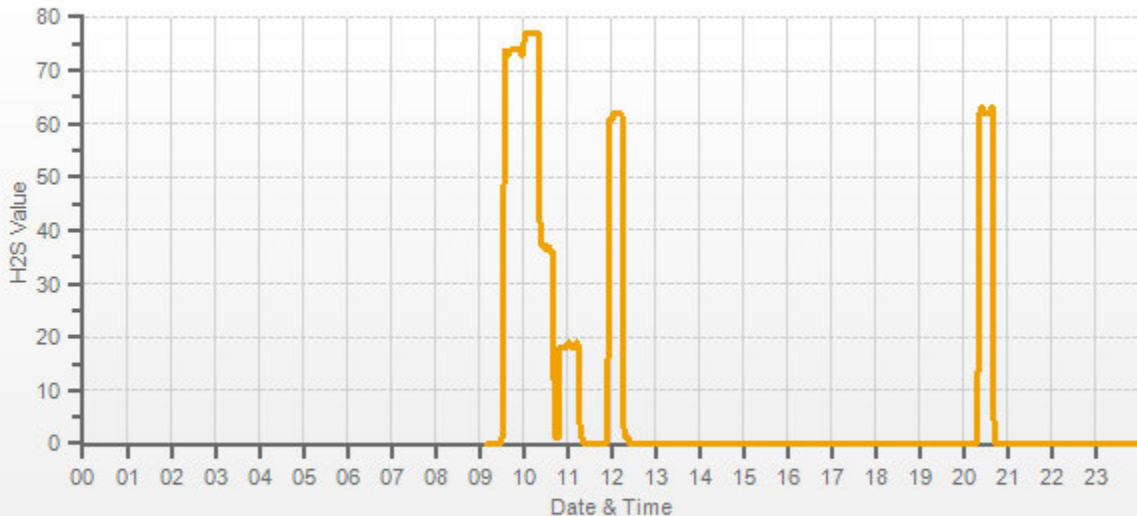


As found: Slope: <u>0.895</u> Offset: <u>70.0</u> Hvps: <u>671</u> Rcell Temp: <u>50.0</u> Box Temp: <u>30.3</u> Pmt Temp: <u>8.0</u> Izs Temp: <u>48.0</u> Converter Temp: <u>315.7</u> Pres: <u>20.7</u> Samp Fl: <u>532</u> Uv Lamp: <u>3359.1</u> Lamp Ratio: <u>100.1</u> Str Lgt: <u>31.3</u> Drk Pmt: <u>0.6</u> Expected Value: <u>62.3</u>	As left: Slope: <u>0.931</u> Offset: <u>66.8</u> Hvps: <u>671</u> Rcell Temp: <u>50.0</u> Box Temp: <u>31.7</u> Pmt Temp: <u>8.0</u> Izs Temp: <u>48.0</u> Converter Temp: <u>314.7</u> Pres: <u>20.7</u> Samp Fl: <u>531</u> Uv Lamp: <u>3357</u> Lamp Ratio: <u>100.2</u> Str Lgt: <u>31.1</u> Drk Pmt: <u>0.6</u> Expected Value: <u>61.9</u>
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Comments:

The manifold blower was found to be working normally.
 A baseline "zero" drift was detected; therefore, a repeat H2S Calibration was performed.

Flow measurement after mid-point.



— H2S[ppb]

TOTAL HYDROCARBON



Thermo 51C Total HydrocarbonTHC Analyzer Calibration

Date:	October 5, 2017	Barometer/B.P./units:	F.S. 05544 expires December 5, 2018	933	millibars
Company/Airshed:	LICA	Thermometer/Station Temp:	F.S. 170286131 expires April 19, 2019	22	°C
Location/Station Name:	St. Lina	Weather Conditions:	Mainly sunny		
Parameter:	Total Hydrocarbon	Calibration Purpose:	routine monthly		
Start/End Time 24 hr. (mst):	9:22 / 13:18	Performed By/Reviewer:	Alex Yakupov	Tom Bourque	
Calibration Method:	Gas Dilution	Cal Gas Expiry Date:	November 25, 2023		

Analyzer:	ID# or Serial Number:	51CLT-77021-384	Range ppm:	50
	Last Calibration Date:	September 8, 2017	As Found C.F.:	0.930
	Previous Cal High Point C.F.:	1.000	New C.F.:	0.997

Calibration Standards:	Low Flow Meter ID/Expiry Date:	Defender Low 152020 expires November 21, 2017	High Flow Meter ID/Expiry Date:	Defender High 148943 expires November 21, 2017
	Calibrator ID/Expiry Date:	API id# 627 expires January 27, 2018	Cal Gas Cylinder I.D. #:	LL 165372
	CH ₄ /C ₃ H ₈ Cylinder Conc. (ppm):	606.0	212.0	
	CH ₄ as propane/total CH ₄ equivalents (ppm):	583.0	1189.0	

Standard Calibration Points for a Range of:		50 ppm
Point	Target ppm	
High	38	
Mid	18	
Low	9	

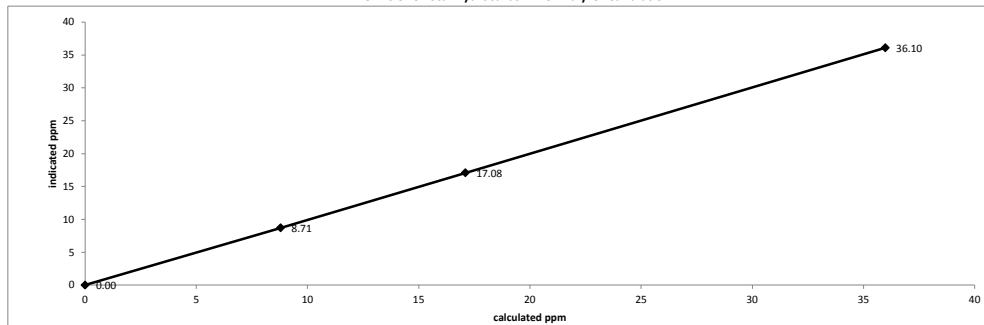
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Point	Diluent	Cal Gas	Total	Calculated Concentration (ppm)	Indicated Concentration (ppm)	Correction Factors:
as found zero	2681	0.00	2681	0.0	0.00	n/a
as found high	2678	83.58	2762	35.98	38.70	0.930
adjusted zero	2681	0.00	2681	0.00	0.00	n/a
adjusted high	2678	83.58	2762	35.98	36.10	0.997
mid	2677	39.06	2716	17.10	17.08	1.001
low	2684	19.99	2704	8.79	8.71	1.009
calibrator zero	2681	0.00	2681	0.0	0.00	n/a
Average C.F.=						1.002

Linear Regression/Calibration Results:

Correlation Coefficient =	1.000	LIMITS
Slope =	0.996	> or = 0.995
b (Intercept as % of full scale) =	0.12%	0.95-1.05
% change in C.F. from last cal =	7.03%	± 3% F.S.
		± 10%

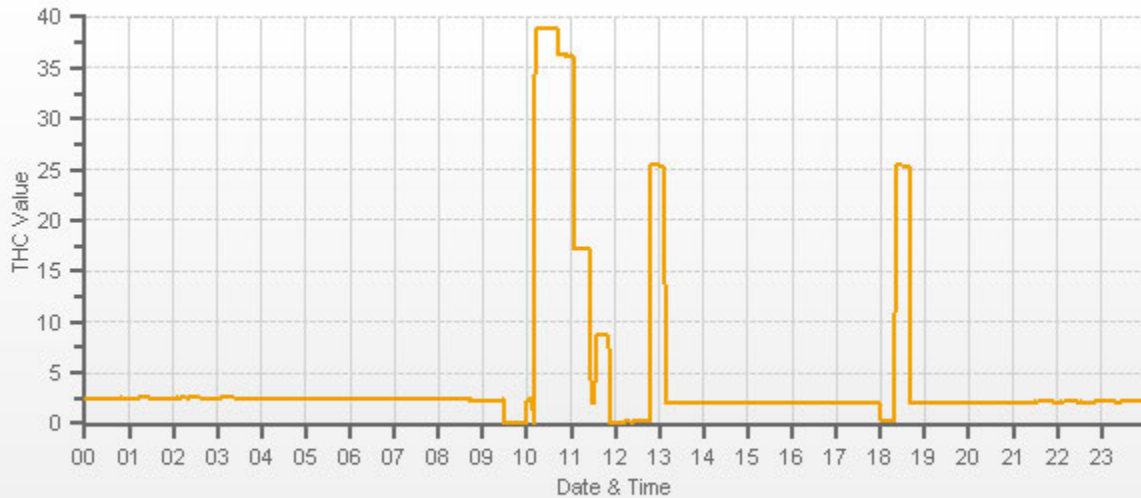
Thermo 51C Total HydrocarbonTHC Analyzer Calibration



As found:	As left:
H2 cylinder (psi): 1300	H2 cylinder (psi): 1300
H2 cylinder reg set (psi): 25	H2 cylinder reg set (psi): 25
Span Cylinder (psi): 600	Span Cylinder (psi): 600
Span Cylinder Reg Set (psi): 22	Span Cylinder Reg Set (psi): 22
Zero Air Gen Pressure: 47	Zero Air Gen Pressure: 47
measurement alarms: None	measurement alarms: None
service alarms: None	service alarms: None
cnt: 2157	cnt: 2134
rng: 1	rng: 1
try: 1	try: 1
flm: 195.8	flm: 195.4
det: 125.6	det: 125.7
Flame: 195	Flame: 195
Filter: 125	Filter: 125
Base: 125	Base: 125
Sample psi: 06.92	Sample psi: 06.92
Internal Air Pressure: 20	Internal Air Pressure: 20
Internal Fuel Pressure: 13	Internal Fuel Pressure: 13
Measured Flow: 1.052	Measured Flow: n/a
Expected Value: 27.20	Expected Value: 25.30

Comments:
 The analyzer sample inlet filter was changed.
 No zero adjustment was required/made.
 The analyzer cooling fan filter(s) were cleaned.
 The manifold blower was found to be working normally.
 Flow measurement after mid-point.

THC[ppm] Station: LICA ST. LINA Daily: 17/10/05 Type: AVG 1 Min. [1 Min.]



— THC[ppm]



Thermo 51C Total Hydrocarbon Analyzer Calibration

Date: <u>October 26, 2017</u>	Barometer/B.P./units: <u>Brunton 05535 expires December 5, 2017</u>	<u>946</u>	millibars
Company/Airshed: <u>LICA</u>	Thermometer/Station Temp: <u>F.S. 160459244 expires May 18, 2018</u>	<u>22</u>	°C
Location/Station Name: <u>St Lina</u>	Weather Conditions: <u>Mainly clear</u>		
Parameter: <u>Total Hydrocarbon</u>	Calibration Purpose: <u>post repair</u>		
Start/End Time 24 hr. (mst): <u>08:53 / 12:20</u>	Performed By/Reviewer: <u>Chris Wesson</u>	<u>Tom Bourque</u>	
Calibration Method: <u>Gas Dilution</u>	Cal Gas Expiry Date: <u>November 23, 2025</u>		

Analyzer: ID# or Serial Number: <u>51CLT-77021-384</u>	Range ppm: <u>50</u>
Last Calibration Date: <u>n/a</u>	As Found C.F.: <u>n/a</u>
Previous Cal High Point C.F.: <u>n/a</u>	New C.F.: <u>1.001</u>

Calibration Standards:

Low Flow Meter ID/Expiry Date: <u>Defender Low 153358 expires January 19, 2018</u>	Standard Calibration Points for a Range of: <u>50 ppm</u>
High Flow Meter ID/Expiry Date: <u>Defender High 152571 expires January 19, 2018</u>	
Calibrator ID/Expiry Date: <u>Sabio id# 17100415 expires May 16, 2018</u>	
Cal Gas Cylinder I.D. #: <u>LL86139</u>	
CH ₄ /C ₃ H ₈ Cylinder Conc. (ppm):	
599.0 211.0	
CH ₄ as propane/total CH ₄ equivalents (ppm):	
580.3 1179.3	

Point	Target ppm
High	38
Mid	18
Low	9

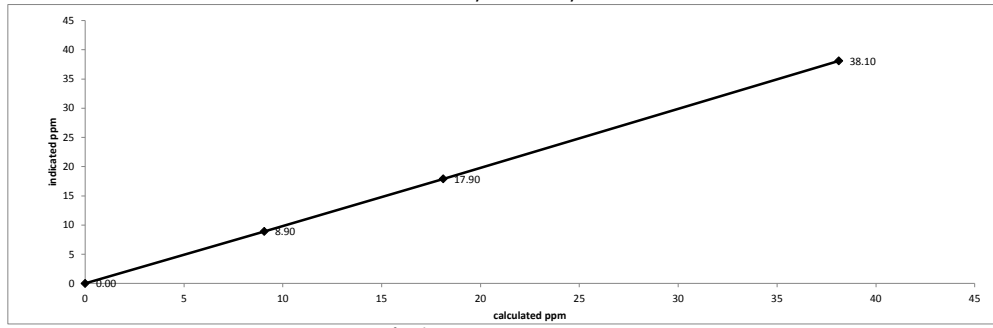
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Calibrator Flow Rates (cc/min)				Calculated Concentration:	Indicated Concentration:	Correction Factors:
Point	Diluent	Cal Gas	Total	(ppm)	(ppm)	
adjusted zero	2495	0.00	2495	0.0	0.00	n/a
adjusted high	2412	80.59	2493	38.12	38.10	1.001
mid	2459	38.35	2497	18.11	17.90	1.012
low	2482	19.21	2501	9.06	8.90	1.018
calibrator zero	2495	0.00	2495	0.00	-0.10	n/a
Average C.F.=						1.010

Linear Regression/Calibration Results:

Correlation Coefficient = <u>1.000</u>	LIMITS
Slope = <u>1.000</u>	> or = 0.995
b (Intercept as % of full scale) = <u>0.21%</u>	0.95-1.05
% change in C.F. from last cal = <u>n/a</u>	± 3% F.S.
	n/a

Thermo 51C Total Hydrocarbon Analyzer Calibration



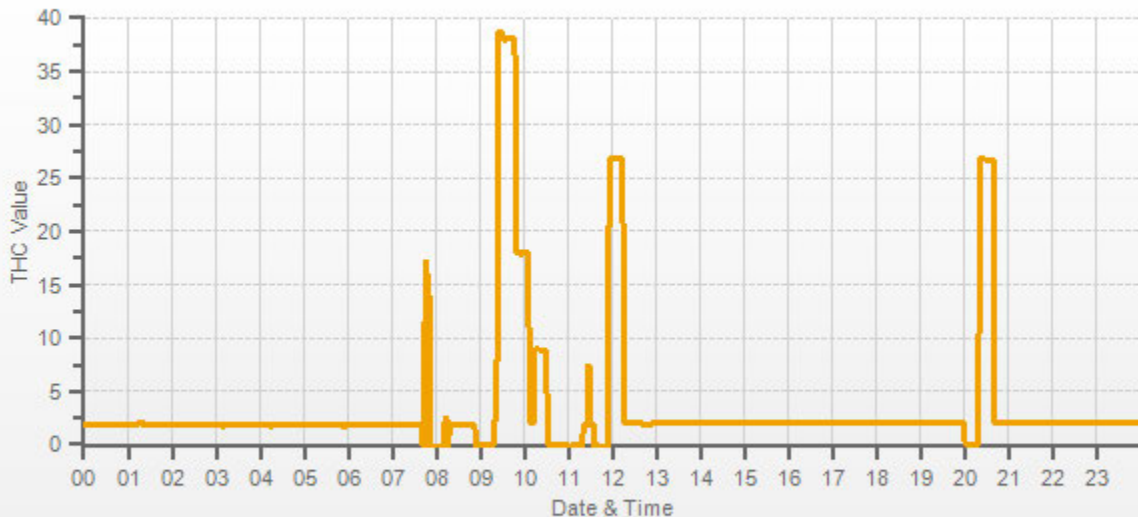
<p style="text-align: center;">As found:</p> <p>H2 cylinder (psi): <u>1800</u></p> <p>H2 cylinder reg set (psi): <u>22</u></p> <p>Span Cylinder (psi): <u>550</u></p> <p>Span Cylinder Reg Set (psi): <u>20</u></p> <p>Zero Air Gen Pressure: <u>40</u></p> <p>measurement alarms: <u>none</u></p> <p>service alarms: <u>none</u></p> <p>cnt: <u>2580</u></p> <p>rng: <u>1</u></p> <p>try: <u>0</u></p> <p>flm: <u>199.5</u></p> <p>det: <u>125.2</u></p> <p>Flame: <u>199</u></p> <p>Filter: <u>125</u></p> <p>Base: <u>125</u></p> <p>Sample psi: <u>6.89</u></p> <p>Internal Air Pressure: <u>20</u></p> <p>Internal Fuel Pressure: <u>13</u></p> <p>Measured Flow: <u>1.0 L/min</u></p> <p>Expected Value: <u>27.10</u></p>	<p style="text-align: center;">As left:</p> <p>H2 cylinder (psi): <u>1800</u></p> <p>H2 cylinder reg set (psi): <u>22</u></p> <p>Span Cylinder (psi): <u>550</u></p> <p>Span Cylinder Reg Set (psi): <u>35</u></p> <p>Zero Air Gen Pressure: <u>40</u></p> <p>measurement alarms: <u>none</u></p> <p>service alarms: <u>none</u></p> <p>cnt: <u>2550</u></p> <p>rng: <u>1</u></p> <p>try: <u>1</u></p> <p>flm: <u>199.0</u></p> <p>det: <u>125.0</u></p> <p>Flame: <u>199</u></p> <p>Filter: <u>125</u></p> <p>Base: <u>125</u></p> <p>Sample psi: <u>6.90</u></p> <p>Internal Air Pressure: <u>20</u></p> <p>Internal Fuel Pressure: <u>13</u></p> <p>Measured Flow: <u>n/a</u></p> <p>Expected Value: <u>26.86</u></p>
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Comments:

The manifold blower was found to be working normally.

Successful calibration following pump repair.

Flow measurement after mid-point.



— THC[ppm]

NITROGEN DIOXIDE



API 200E NO-NO2-NOx Analyzer Calibration

Date: <u>October 7, 2017</u>	Barometer/B.P./units: <u>F.S. 05544 expires December 5, 2018</u>	<u>939</u>	millibars
Company/Airshed: <u>LICA</u>	Thermometer/Station Temp: <u>F.S. 170286131 expires April 19, 2019</u>	<u>20</u>	°C
Location/Station Name: <u>St. Lina</u>	Weather Conditions: <u>Mainly sunny</u>		
Start/End Time 24 hr. (mst): <u>11:22 / 17:32</u>	Calibration Purpose: <u>routine monthly</u>		
G.P.T. to be used for Ozone? <u>No</u>	Performed By/Reviewer: <u>Alex Yakupov</u>	<u>Tom Bourque</u>	
Calibration Method: <u>Gas Dilution & Varying UV Lamp Power</u>	Cal Gas Expiry Date: <u>July 18, 2019</u>		

Analyzer:		Correction Factors:		
ID# or Serial Number: <u>594</u>	Previous C.F.:	As Found C.F.:	New C.F.:	
Last Calibration Date: <u>September 7, 2017</u>	NO = <u>0.997</u>	<u>1.001</u>	<u>0.997</u>	
Range ppb: <u>1000</u>	NO ₂ = <u>0.974</u>	<u>0.984</u>	<u>0.984</u>	
	NOx = <u>0.997</u>	<u>0.994</u>	<u>0.997</u>	

Calibration Standards:				
Low Flow Meter ID/Expiry Date: <u>Defender Low 152020 expires November 21, 2017</u>	Standard Calibration Points for a Range of: <u>1000 ppb</u>			
High Flow Meter ID/Expiry Date: <u>Defender High 148943 expires November 21, 2017</u>	Point	Target NO (ppb)	Target NO ₂ (ppb)	Cc Ozone ?
Calibrator ID/Expiry Date: <u>API Id# 627 expires January 27, 2018</u>	High	<u>780</u>	<u>500</u>	<u>n/a</u>
Cal Gas Cylinder I.D. #: <u>LL 104222</u>	Mid	<u>380</u>	<u>275</u>	<u>n/a</u>
Cal Gas Conc. (ppm): <u>50.7</u> <u>50.7</u>	Low	<u>190</u>	<u>100</u>	<u>n/a</u>
	Extra Point #1	<u>n/a</u>	<u>n/a</u>	<u>n/a</u>
	Extra Point #2	<u>n/a</u>	<u>n/a</u>	<u>n/a</u>

ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Calibrator Flow Rates (cc/min)				Calculated NO	Calculated NOx	Indicated NO	Indicated NOx	NO C.F.	NOx C.F.
Point	Diluent	Cal Gas	Total Flow	(ppb)	(ppb)	(ppb)	(ppb)		
as found zero	5179	0.0	5179	0	0	1.0	1.0	n/a	n/a
as found high	5242	77.52	5320	738.8	738.8	739.0	744.0	1.001	0.994
adjusted zero	5179	0.00	5179	0.0	0.0	0.0	0.0	n/a	n/a
adjusted high	5242	77.52	5320	738.8	738.8	741.0	741.0	0.997	0.997
mid	5269	37.60	5307	359.2	359.2	360.0	360.0	0.998	0.998
low	5277	18.76	5296	179.6	179.6	180.0	179.0	0.998	1.003
calibrator zero	5179	0.00	5179	0	0	0.0	0.0	n/a	n/a
Average C.F.=								0.998	0.999

ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Calibrator Flow Rates (cc/min)				Calibrator Setting	Indicated NO	Indicated NOx	Indicated NO ₂	NO drop	NO ₂ gain	NO ₂ C.F.
Point	Diluent	Cal Gas	Total Flow	volts or ppb	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)
NOx reference	5242	77.52	5320	0.0	738.0	737.0	1.0	0.0	1.0	
as found high NO2	5242	77.52	5320	520.0	242.0	745.0	505.0	496.0	504.0	0.984
adjusted high NO2	5242	77.52	5320	520.0	242.0	745.0	505.0	496.0	504.0	0.984
gpt mid	5242	77.52	5320	275.0	476.0	739.0	265.0	262.0	264.0	0.992
gpt low	5242	77.52	5320	105.0	643.0	735.0	94.0	95.0	93.0	1.022
Average NO ₂ C.F.=										0.999

Linear Regression/Calibration Results:				LIMITS	
Correlation Coefficient =	<u>1.000</u>	<u>1.000</u>	<u>1.000</u>	> or =	<u>0.995</u>
Slope =	<u>0.997</u>	<u>0.997</u>	<u>0.983</u>	0.95-1.05	
b (Intercept as % of full scale)=	<u>-0.01%</u>	<u>-0.05%</u>	<u>-0.13%</u>	± 3% F.S.	
% change in C.F. from last cal=	<u>-0.41%</u>	<u>0.27%</u>	<u>-1.04%</u>	± 10%	
NO2 converter efficiency	<u>0.97</u>	<u>0.97</u>	<u>0.97</u>	0.96 to 1.04	

As found:		As left:	
NOx SLOPE:	<u>0.951</u>	NOx SLOPE:	<u>0.950</u>
NOx OFFS:	<u>2.8</u>	NOx OFFS:	<u>4.0</u>
NO SLOPE:	<u>0.952</u>	NO SLOPE:	<u>0.953</u>
NO OFFS:	<u>1.2</u>	NO OFFS:	<u>-0.1</u>
SAMP FLW:	<u>487</u>	SAMP FLW:	<u>487</u>
OZONE FL:	<u>79</u>	OZONE FL:	<u>78</u>
PMT:	<u>26.5</u>	PMT:	<u>16.5</u>
NORM PMT:	<u>-0.7</u>	NORM PMT:	<u>2.9</u>
AZERO:	<u>16.7</u>	AZERO:	<u>17.5</u>
HVPS:	<u>767</u>	HVPS:	<u>767</u>
RCCELL TEMP:	<u>50.0</u>	RCCELL TEMP:	<u>50.0</u>
BOX TEMP:	<u>31.4</u>	BOX TEMP:	<u>32.1</u>
PMT TEMP:	<u>6.7</u>	PMT TEMP:	<u>6.7</u>
IZS TEMP:	<u>45.3</u>	IZS TEMP:	<u>45.0</u>
MOLY TEMP:	<u>314.8</u>	MOLY TEMP:	<u>313.9</u>
RCEL:	<u>5.4</u>	RCEL:	<u>5.4</u>
SAMP:	<u>26.8</u>	SAMP:	<u>26.8</u>
Expected Value NO:	<u>10</u>	Expected Value NO:	<u>10</u>
Expected Value NO2:	<u>584</u>	Expected Value NO2:	<u>580</u>
Expected Value NOx:	<u>592</u>	Expected Value NOx:	<u>588</u>

Comments:

The analyzer sample inlet filter was changed.

The manifold blower was found to be working normally.

No high point NO2 adjustment was required/made.

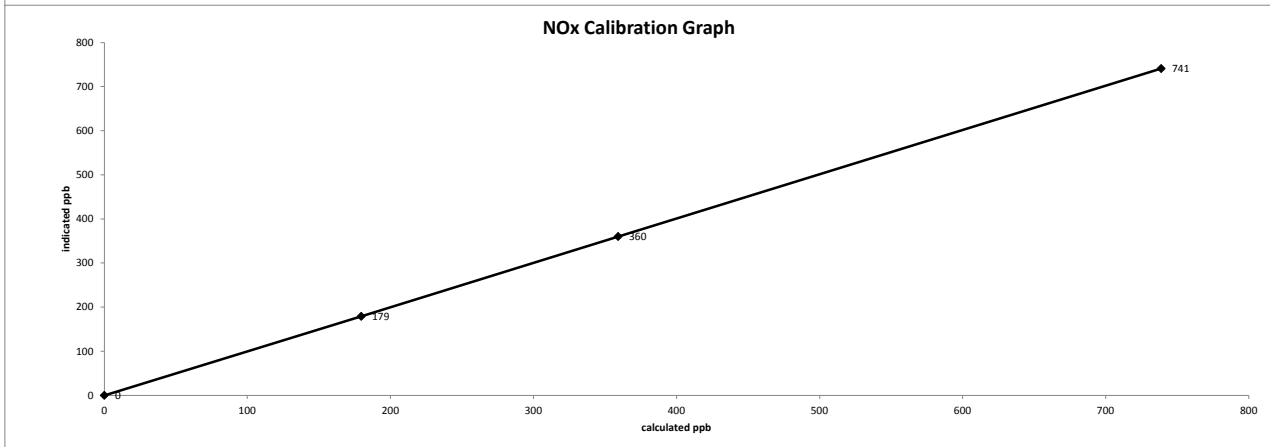
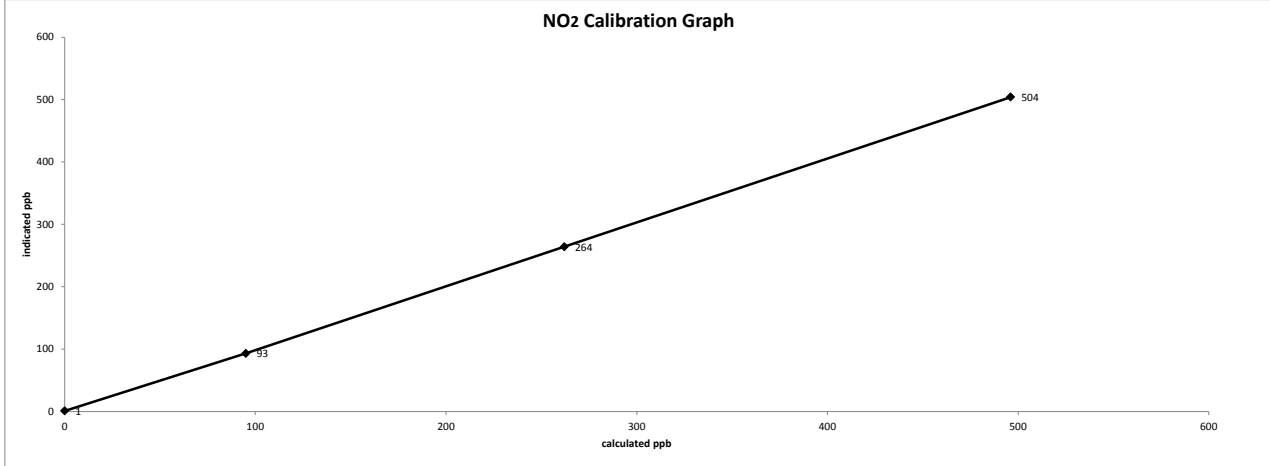
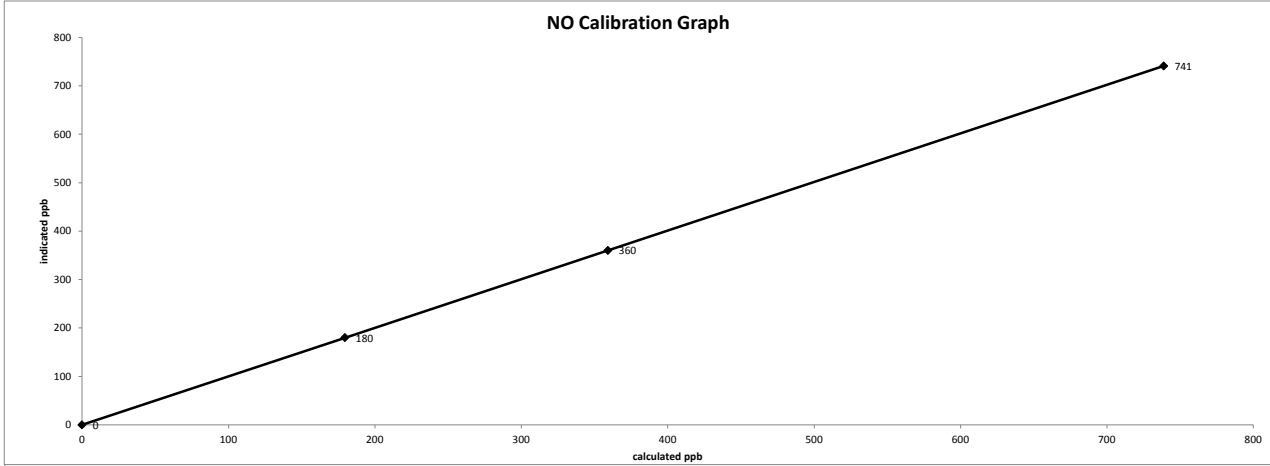
Flow measurement after mid-point.

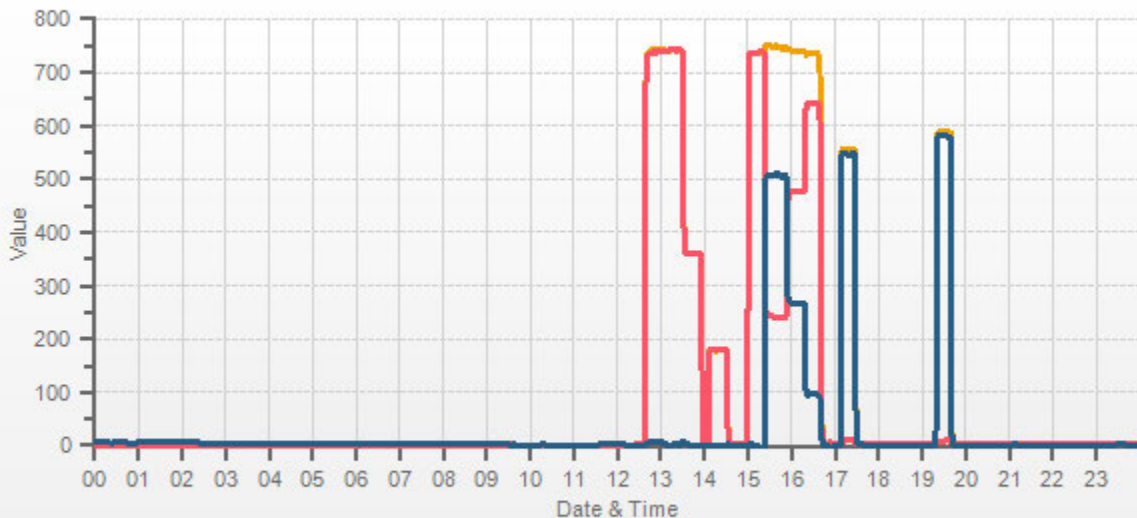
Calibration gas concentration derived from original certificate.

Date: October 7, 2017
Company/Airshed: LICA
Location/Station Name: St. Lina

Start/End Time 24 hr. (mst): 11:22 / 17:32
Calibration Purpose: routine monthly
Calibration Method: Gas Dilution & Varying UV Lamp Power

API 200E NO-NO2-NOx Analyzer Calibration





— NOX[ppb] — NO[ppb] — NO2[ppb]

OZONE



Thermo 49i Ozone Analyzer Calibration

Date: October 5, 2017 Company/Airshed: LICA Location/Station Name: St. Lina Start/End Time 24 hr. (mst): 9:22 / 13:55 Ozone Calibration Method: Varying UV Lamp Power G.P.T. Date: n/a-done by Varying UV Lamp Power	Barometer/B.P./units: F.S. 05544 expires December 5, 2018 933 millibars Thermometer/Station Temp: F.S. 170286131 expires April 19, 2019 22 °C Weather Conditions: Mainly sunny Calibration Purpose: routine monthly Performed By/Reviewer: Alex Yakupov Tom Bourque Cal Gas Expiry Date: n/a-done by Varying UV Lamp Power
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Analyzer: ID# or Serial Number: 1002240371 Last Calibration Date: September 8, 2017 Previous Cal High Point C.F.: 1.000	Ozone Range ppb: 500 As Found C.F.: 1.035 New C.F.: 1.000
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Calibration Standards: Low Flow Meter ID/Expiry Date: Defender Low 152020 expires November 21, 2017 High Flow Meter ID/Expiry Date: Defender High 148943 expires November 21, 2017 Calibrator ID/Expiry Date: Sabio id# 11900613 expires March 16, 2018 Cal Gas Cylinder I.D. #: n/a	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>Point</th> <th>AMD Required Range of Ozone Calibration Points</th> </tr> <tr> <td>High</td> <td>300-400 ppb</td> </tr> <tr> <td>Mid</td> <td>150-200 ppb</td> </tr> <tr> <td>Low</td> <td>50-75 ppb</td> </tr> </table>	Point	AMD Required Range of Ozone Calibration Points	High	300-400 ppb	Mid	150-200 ppb	Low	50-75 ppb
Point	AMD Required Range of Ozone Calibration Points								
High	300-400 ppb								
Mid	150-200 ppb								
Low	50-75 ppb								

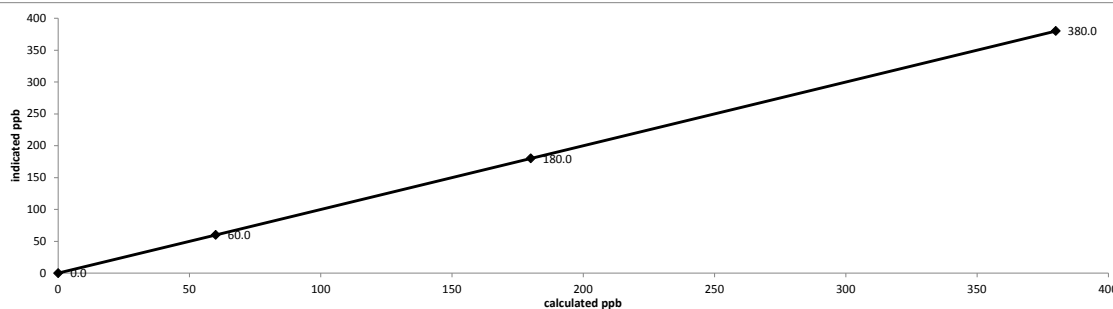
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Point	Calibrator Flow Rate (cc/min)		Calculated Concentration:	Corrected Calculated Concentration:	Indicated Concentration:	Correction Factors:
	Total Flow @ Point Start	Total Flow @ Point Finish	(ppb)	(ppb)	(ppb)	
as found zero	5000	5000	0.0	n/a	0.0	n/a
as found high	5000	5000	380.0	380.0	367.0	1.035
adjusted zero	5000	5000	0.0	0.0	0.0	n/a
adjusted high	5000	5000	380.0	380.0	380.0	1.000
mid	5000	5000	180.0	180.0	180.0	1.000
low	5000	5000	60.0	60.0	60.0	1.000
calibrator zero	5000	5000	0.0	n/a	0.0	n/a
Average C.F.=						1.000

Linear Regression/Calibration Results:

Correlation Coefficient = 1.000 Slope = 1.000 b (Intercept as % of full scale)= 0.00% % change in C.F. from last cal= -3.54%	LIMITS > or = 0.995 0.95-1.05 ± 3% F.S. ± 10%
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Thermo 49i Ozone Analyzer Calibration

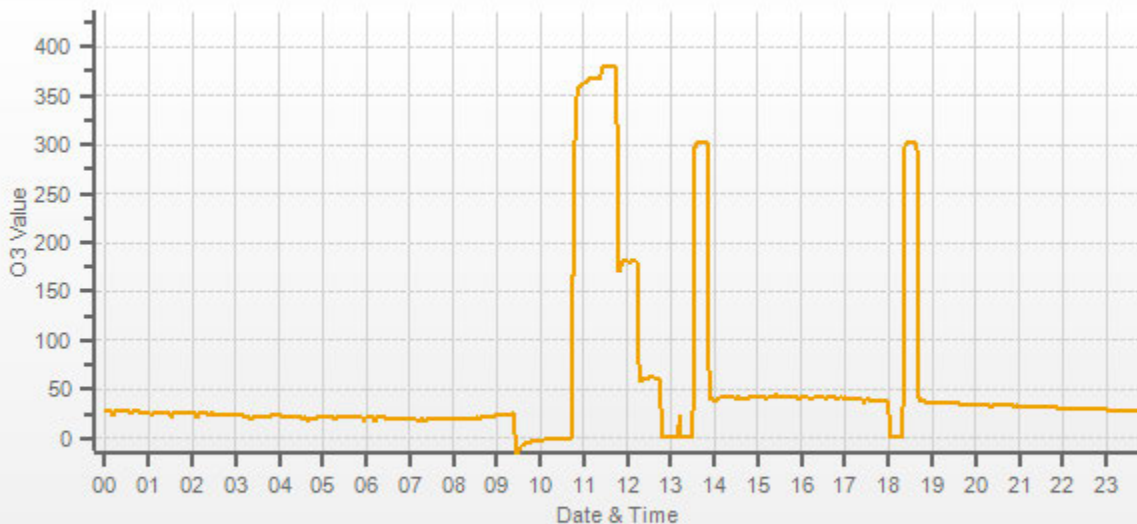


As found: O3 Bkg: -0.1 O3 Coef: 0.937 Photo Lamp: 10.7 O3 Lamp: 8.2 Bench: 29.0 Bench Lamp: 53.6 O3 Lamp: 67.8 Pressure: 681.5 Cell A lpm: 0.732 Cell B lpm: 0.782 O3 ppb: -4.5 Cell A ppb: -3.4 Cell B ppb: -5.6 Cell A int: 82043 Cell B int: 102387.0 Expected Value: 287.0	As left: O3 Bkg: -0.1 O3 Coef: 0.966 Photo Lamp: 10.7 O3 Lamp: 8.2 Bench: 28.8 Bench Lamp: 53.6 O3 Lamp: 67.8 Pressure: 680.3 Cell A lpm: 0.732 Cell B lpm: 0.739 O3 ppb: 0.1 Cell A ppb: -0.7 Cell B ppb: 0.1 Cell A int: 81928 Cell B int: 102291.0 Expected Value: 301.0
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Comments:

The analyzer sample inlet filter was changed.
 The analyzer cooling fan filter(s) were cleaned.
 The manifold blower was found to be working normally.

No zero adjustment was required/made.



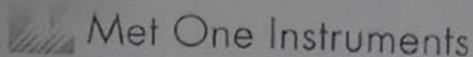
— O3[ppb]

PARTICULATE MATTER

"I" Series Sharp 5030 Monitor Monthly Audit

Date:	October 16, 2017	Performed By/Reviewer:	Alex Yakupov Tom Bourque
Company:	LICA	Start Time (mst):	11:35
Station Name/Location:	St. Lina	End Time (mst):	12:48
Previous Audit Date:	September 8, 2017	Calibration Purpose:	routine monthly
Parameter:	PM 2.5	Weather Conditions:	Cloudy/Overcast
SHARP Information and Status:			
Serial Number:	CM1709001	Status:	SAMPLE
Approx. % Tape remaining:	2/5	Error Code:	None
Reference Standards/I.D./Expiry Date:			
High Flow:	Airmetrics/Chinook High Maxxam ID #2 expires March 24, 2018		
Digital Manometer:	Dwyer 475 Mark III id# 3 expires January 3, 2018		
Temperature:	F.S. 170286131 expires April 19, 2019		
Pressure:	F.S. 05544 expires December 5, 2018		
RH:	F.S. 170286131 expires April 19, 2019		
As found temperature and pressure:			
Tolerance °C +/-	3	Tolerance mmHg +/-	12
SHARP T1 (°C):	10.4	SHARP P3 (mmHg):	694.60
Reference (°C):	11.2	Reference (mmHg):	693.80
Difference (°C):	0.8	Difference (mmHg):	-0.8
As left temperature and pressure (same as above if as found adequate):			
Tolerance °C +/-	3	Tolerance mmHg +/-	12
SHARP T1 (°C):	11.2	SHARP P3 (mmHg):	694.60
Reference (°C):	11.2	Reference (mmHg):	693.80
Difference (°C):	0.0	Difference (mmHg):	-0.8
As found flows:			
SHARP Airflow l/hr	1000.00	Tolerance lpm +/-	5%
Pump Voltage (%)	n/a	SHARP Airflow (lpm)	16.67
		Reference Airflow (lpm)	16.90
		Difference (%)	1.38%
As left flows (same as above if as found adequate):			
Targets: 1000 l/hr / <90%		Tolerance lpm +/-	5%
SHARP Airflow l/hr	1000.00	SHARP Airflow (lpm)	16.67
Pump Voltage (%)	n/a	Reference Airflow (lpm)	16.90
		Difference (l/min)	1.38%
As found relative humidity:		As left relative humidity (same as "as found" if adequate):	
Tolerance % +/-	5	Tolerance % +/-	5
Sharp RH (%)	51.1	Sharp RH (%)	45.20
Reference RH (%)	46.8	Reference RH (%)	45.20
Difference:	-4.3	Difference:	0.0
Inlet Assembly:			
Inlet Head/Sharp Cut	Yes/No?	If no, give reason:	
Cleaned:	yes		
Comments:			

WIND SYSTEM



Sonic Wind Sensor Certificate of Calibration

Sensor Model No.: 50.5H
 Sensor Output Swing: 0V - 1.0V
 Customer: MAXXAM Analytics
 Tested per PO: 35-67600
 Calibrated by: David Frith *DF*

Sensor Serial No.: H12635
 Sensor Output Range: 0 - 50.0 MPS
 Sales Order No.: 122618
 Calibration Date: 05/25/2017

QC Inspection *Chris Paul*

Instrument Condition Within Tolerance: As Found As Left
 Corrective Action: No Adjustment Adjust Repair
 Preventative Maintenance

As Found Test Date: N/A As Left Test Date: 05/25/2017

Quality Control Manual Revision: September 16, 2013 MP42201 Rev. G.
 All Work Performed per Customer Purchase Order Requirements.
 Calibration Document No. 50.5-6100

Test Equipment Used for Calibration of Instruments

Description	Manufacturer	Model No.	Serial No.	Cal Date	Cal Due	Voltage Accuracy	Time Base Accuracy
Data Acquisition	Campbell Scientific	CR1000	6569	4/06/2015	4/06/2018	+/- 3mV	< 6 ppm
NIST Cupset	Met One Instruments	170-41	3309	1/26/2017	1/26/2022	Accuracy < 0.15 mph or 1% WS	

Environmental Data: Temperature 65 to 80 Deg F Vibration none
 Humidity 20 to 70% Radiation none

Firmware Version: 3194-01 R2.62

The standards used for calibration have accuracies equal to or greater than the instruments tested. These standards are on record and are traceable to NIST to the extent allowed by the institute's calibration facility. Unless otherwise stated heron, all instruments are calibrated to meet the manufacturer's published specifications. The calibration system complies with MIL-STD-45662A (8/1/88). Instrument's accuracy meets the requirements of Regulatory Guide 1.23 (2/72). Compliant with IS) 9001:2008 requirements

METEOROLOGICAL SYSTEM CHECK

Meteorological System Checklist

Performed by: Alex Yakupov
 Station: **St. Lina**
 Start: 11:07 End: 11:25

PRECIPITATION SENSOR CHECK

	YES	NO
Is the sensor Level?	YES	
Is the heater operating properly?	YES	
Are the bucket drain holes clean?	YES	
Is the inner screen on the housing? (screen should be on between July and September		NO
Is the upper screen on the housing? (screen should be on between July and September)		NO
Is the housing clean?	YES	
Is the area around the housing clean and free from obstacle?	YES	
Is the tipping sensor working properly? (test quantity 2.2 mm at 11:12)	YES	
	PASS	

Comments: Rain gauge was tested with water.
 Responce is timely and accurate. No issues.

Field Technician: Alex Yakupov October 05, 2017

CALIBRATORS

Company Maxxam/SIA **Operator:** Chris

Calibrator:				Flow Measurement Device:			
Make/Model	<u>API 700</u>			Make/Model	<u>Definer 530</u>		
Serial Number	<u>627</u>			Serial Number	<u>H-148944, L-152019</u>		
Last Verification Date	<u>February 3, 2016</u>			Temperature (°C)	<u>23.5</u>		
NO Cylinder S/N	<u>EY0000597</u>			Barometric Pressure	<u>707.1 mmHg</u>		
NO [PPM]	<u>49.0</u>	NOx [PPM]	<u>49.0</u>				
Expiry Date	<u>December 8, 2019</u>						

Dilution Flow (sccm)					
Pt. #1	<u>4892</u>	Pt. #2	<u>4975</u>	Pt. #3	<u>4951</u>
Gas Flow (sccm)					
Pt. #1	<u>79.7</u>	Pt. #2	<u>38.8</u>	Pt. #3	<u>19.4</u>

Calibrator Flow (sccm)		Calculated Conc.(ppm)		Indicated Conc.(ppm)			% Difference vs Audit Gas	
Dilution	Gas	NO	NOx	NO	NO ₂	NOx	NO	NOx
	0.0	0.0000	0.0000	0.0000	-0.0004	-0.0004	Limit ± 10%	
4972	79.7	0.7855	0.7855	0.7883	0.0004	0.7887	0.4%	0.5%
4936	38.8	0.3822	0.3822	0.3816	0.0005	0.3822	-0.2%	0.1%
4970	19.4	0.1913	0.1913	0.1902	0.0006	0.1913	-0.6%	0.2%
Absolute Average Percent Difference							0.1%	0.3%

LINEAR REGRESSION ANALYSIS *y=mx+b (where x=calculated concentration, y=indicated concentration)*

NO	LIMITS	NOx
Correlation= 1.0000	≥ 0.990	Correlation= 1.0000
m (Slope)= 1.0041	0.90-1.10	m (Slope)= 1.0046
b (Intercept % of FS)= -0.1118	± 3% F.S.	b (Intercept % of FS)= -0.0871

Flow	O ₃ Conc	NO Decrease	NO	NO ₂	NOX	% Diff. Vs Audit gas	
4972	0	0.0000	0.7867	0.0014	0.7881	NO ₂	% Diff, Limit
4972	500	0.5127	0.2740	0.5104	0.7849	-0.7%	± 10%
4972	275	0.2863	0.5004	0.2860	0.7865	-0.6%	± 10%
4972	90	0.0940	0.6927	0.0954	0.7880	0.0%	± 10%
Absolute Average Percent Difference						0%	± 10%

LINEAR REGRESSION ANALYSIS *y=mx+b (where x=calculated concentration, y=indicated concentration)*

NO₂	LIMITS
Correlation= 1.0000	≥ 0.995
m (Slope)= 0.9924	0.90-1.10
b (Intercept % of FS)= 0.1755	± 3% F.S.

AENV Standards		NO_x Analyzer	
Audit Calibrator		Make/Model	<u>Thermo 42i</u>
Make/Model	<u>Thermo 146i</u>	Serial/AMU Number	<u>AMU 1868</u>
Serial/AMU Number	<u>AMU1809</u>	Last Calibration Date	<u>January 25, 2017</u>
SRM Gas Cylinder No.	<u>CAL018140</u>	Full Scale (ppm)	<u>1.0</u>
Cylinder Conc. (ppm)	<u>48.79</u>	Cylinder Gas Expiry Date	<u>March 25, 2019</u>

COMMENTS:

Auditor: Shea Beaton
Operator Signature: 

Date: January 27, 2017
Location: McIntyre Center Edmonton

Company <u>Maxxam</u>		Operator: <u>Mike</u>	
Calibrator:		Flow Measurement Device:	
Make/Model	<u>Sabio 2010D</u>	Make/Model	<u>Bios Defender 530</u>
Serial Number	<u>11900613</u>	Serial Number	<u>HI148944 Lo 152019</u>
Last Verification Date	<u>March 31, 2016</u>	Temperature (°C)	<u>23.9</u>
NO Cylinder S/N	<u>EY0000769</u>	Barometric Pressure	<u>698mmHg</u>
NO [PPM]	<u>51.1</u>	NOx [PPM]	<u>51.2</u>
Expiry Date	<u>December 8, 2019</u>		

Dilution Flow (sccm)		
Pt. #1 <u>4879</u>	Pt. #2 <u>4932</u>	Pt. #3 <u>4950</u>
Gas Flow (sccm)		
Pt. #1 <u>74.5</u>	Pt. #2 <u>36.4</u>	Pt. #3 <u>18.2</u>

Calibrator Flow (sccm)		Calculated Conc.(ppm)		Indicated Conc.(ppm)			% Difference vs Audit Gas	
Dilution	Gas	NO	NOx	NO	NO ₂	NOx	NO	NOx
4965	0.0	0.0000	0.0000	0.0001	0.0000	0.0001	Limit ± 10%	
4954	74.5	0.7685	0.7700	0.7915	0.0008	0.7923	3%	3%
4968	36.4	0.3744	0.3751	0.3832	0.0006	0.3838	2%	2%
4968	18.2	0.1872	0.1876	0.1916	0.0002	0.1918	2%	2%
Absolute Average Percent Difference							3%	2%

LINEAR REGRESSION ANALYSIS			<i>y=mx+b (where x=calculated concentration, y=indicated concentration)</i>		
NO		LIMITS		NOx	
Correlation=	1.0000	≥ 0.990		Correlation=	1.0000
m (Slope)=	1.0301	0.90-1.10		m (Slope)=	1.0291
b (Intercept % of FS)=	-0.0919	± 3% F.S.		b (Intercept % of FS)=	-0.0881

Flow	O ₃ Conc	NO Decrease	NO	NO ₂	NOX	% Diff. Vs Audit gas	
4954	0.000	0.0000	0.7949	0.0005	0.7954	NO ₂	% Diff. Limit
4954	0.510	0.5104	0.2845	0.5072	0.7917	-1%	± 10%
4954	0.250	0.2516	0.5433	0.2514	0.7944	0%	± 10%
4954	0.100	0.1085	0.6864	0.1087	0.7951	0%	± 10%
Absolute Average Percent Difference						0%	± 10%

LINEAR REGRESSION ANALYSIS			<i>y=mx+b (where x=calculated concentration, y=indicated concentration)</i>		
NO₂		LIMITS			
Correlation=	1.0000	≥ 0.995			
m (Slope)=	0.9926	0.90-1.10			
b (Intercept % of FS)=	0.0925	± 3% F.S.			

AENV Standards		NO_x Analyzer	
Audit Calibrator			
Make/Model	<u>Thermo 146i</u>	Make/Model	<u>Thermo 42i</u>
Serial/AMU Number	<u>1809</u>	Serial/AMU Number	<u>1868</u>
SRM Gas Cylinder No.	<u>CAL018140</u>	Last Calibration Date	<u>March 15, 2017</u>
Cylinder Conc. (ppm)	<u>48.79</u>	Full Scale (ppm)	<u>1.0</u>
		Cylinder Gas Expiry Date	<u>March 28, 2019</u>

COMMENTS: Gas has ~50ppm SO2

Auditor: Shea Beaton
Operator Signature:

Date: March 16, 2017
Location: McIntyre Center Edmonton

Company <u>Maxxam</u>		Operator: <u>Micheal Espiritu</u>	
Calibrator:		Flow Measurement Device:	
Make/Model	<u>Sabio 2010</u>	Make/Model	<u>Mesa Defender 530</u>
Serial Number	<u>17100415</u>	Serial Number	<u>L-152019 H-148944</u>
Last Verification Date	<u>May 2016</u>	Temperature (°C)	<u>25.0 C</u>
NO Cylinder S/N	<u>EY0000597</u>	Barometric Pressure	<u>697 mmhg</u>
NO [PPM]	<u>49.0</u>	NOx [PPM]	<u>49.0</u>
Expiry Date	<u>December 2019</u>		

Dilution Flow (sccm)		
Pt. #1 <u>5000</u>	Pt. #2 <u>5000</u>	Pt. #3 <u>5000</u>
Gas Flow (sccm)		
Pt. #1 <u>80</u>	Pt. #2 <u>40</u>	Pt. #3 <u>20</u>

Calibrator Flow (sccm)		Calculated Conc.(ppm)		Indicated Conc.(ppm)			% Difference vs Audit Gas	
Dilution	Gas	NO	NOx	NO	NO ₂	NOx	NO	NOx
4996	0.0	0.000	0.000	0.000	0.000	0.000	Limit ± 10%	
5029	80.3	0.784	0.783	0.808	-0.013	0.794	3%	1%
5054	38.8	0.376	0.376	0.392	-0.006	0.386	4%	3%
5051	19.5	0.189	0.189	0.196	-0.003	0.193	4%	2%
Absolute Average Percent Difference							4%	2%

LINEAR REGRESSION ANALYSIS *y=mx+b (where x=calculated concentration, y=indicated concentration)*

NO	LIMITS	NOx
Correlation= 1.0000	≥ 0.990	Correlation= 1.0000
m (Slope)= 1.0311	0.90-1.10	m (Slope)= 1.0140
b (Intercept % of FS)= 0.1350	± 3% F.S.	b (Intercept % of FS)= 0.1531

Flow	O ₂ Conc (LC)	NO Decrease	NO	NO ₂	NOX	% Diff. Vs Audit gas	
5029	0.000	0.000	0.803	-0.013	0.790	NO ₂	% Diff. Limit
5029	1.508	0.568	0.235	0.552	0.787	-1%	± 10%
5029	0.882	0.312	0.491	0.298	0.789	0%	± 10%
5029	0.390	0.108	0.695	0.095	0.789	0%	± 10%
Absolute Average Percent Difference						0%	± 10%

LINEAR REGRESSION ANALYSIS *y=mx+b (where x=calculated concentration, y=indicated concentration)*

NO₂	LIMITS
Correlation= 1.0000	≥ 0.995
m (Slope)= 0.9945	0.90-1.10
b (Intercept % of FS)= -1.2646	± 3% F.S.

AENV Standards	NO_x Analyzer
Audit Calibrator	
Make/Model <u>Teco 146i</u>	Make/Model <u>Teco 42i</u>
Serial/AMU Number <u>AMU 1809</u>	Serial/AMU Number <u>AMU 1868</u>
SRM Gas Cylinder No. <u>CAL018101</u>	Last Calibration Date <u>May 16, 2017</u>
Cylinder Conc. (ppm) <u>48.79</u>	Full Scale (ppm) <u>1.0</u>
	Cylinder Gas Expiry Date <u>March 2019</u>

COMMENTS: Contains 50.4 ppm SO₂.

Auditor: Al Clark
Operator Signature:

Date: May 16, 2017
Location: McIntyre Center Edmonton

CALIBRATION GASES



Calibration Gas Audit

Single Component Cylinder Gas

File No. 2016-335CGA

Company: Maxxam **Operator's Name:** Russell Kirchner

Cylinder #: LL104222 Concentration PPM: 50.6 Tolerance(%) 1 Certified By: Praxair

Expiry Date: July 2019

Reference Calibrator and Gas:	Flow Measurement Device:
Make/Model: <u>R&R MFC 201</u>	Make/Model: <u>Bios DC2</u>
Serial Number: <u>AMU 1690</u>	Serial Number: <u>AMY 1659</u>
Last Verification Date: <u>October 19, 2016</u>	Temp. °C: <u>24.5 C</u>
Gas Type: <u>SO2</u> Conc. <u>98.07</u>	B.P. <u>706 mmhg</u>
Cylinder Number: <u>CA:016625</u>	
Expiry Date: <u>January 2019</u>	

Reference Analyzer:

Make/Model: Teco 43C Serial/AMU Number: 1623

Instrument Settings: Zero: 9.2 Span: 1.024 Range: 1.0

Last Calibration: Date: Oct 19/16 C.F. 1.000 Done By: Al Clark

Calibrator Flows (sccm)		Indicated Concentration (PPM)	Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration
Dilution	Gas				
5000	0.0	0.000	0.01662	60.183	50.0
4935	82.0	0.830	0.01662	60.183	50.0
4968	40.8	0.412	0.00821	121.765	50.2
4955	20.2	0.203	0.00408	245.297	49.8
Average Cylinder Concentration:					50.0

Previous Stated Concentration PPM: 50.6

Percent variance from Stated: 1

Meets Manufacturer Tolerance. Use manufacturers stated concentration **COMMENTS:** _____

< =5% Outside Manufacturer Tolerance. Use manufacturers concentration _____

> 5% Outside Manufacturer Tolerance. **DO NOT USE** this cylinder _____

Auditor: Al Clark

Operator Signature: *Al Clark*

Date: October 19, 2016

Location: McIntyre Center Edmonton



Calibration Gas Audit

Single Component Cylinder Gas

File No. 2016-334CGA

Company: Maxxam **Operator's Name:** Russell Kirchner
Cylinder #: EY0000654 **Concentration PPM:** 10.2 **Tolerance(%)** 2 **Certified By:** Praxair
Expiry Date: June 2019

Reference Calibrator and Gas:	Flow Measurement Device:
Make/Model: <u>R&R MFC 201</u>	Make/Model: <u>Bios DC2</u>
Serial Number: <u>AMU 1690</u>	Serial Number: <u>AMU 1659</u>
Last Verification Date: <u>October 19, 2016</u>	Temp. °C: <u>24.0 C</u>
Gas Type: <u>H2S</u> Conc. <u>20.43</u>	B.P. <u>706 mmhg</u>
Cylinder Number: <u>CAL015584</u>	
Expiry Date: <u>January 2019</u>	

Reference Analyzer:
 Make/Model: Teco 450i Serial/AMU Number: 1980
 Instrument Settings: Zero: 16.6 Span: 1.231 Range: 0.1
 Last Calibration: Date: Oct 19/16 C.F. 1.000 Done By: Al Clark

Calibrator Flows (scm)		Indicated Concentration (PPM)	Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration
Dilution	Gas				
5000	0.0	0.0000	0.0000	0.0000	0.0000
5050	38.0	0.0764	0.00752	132.895	10.2
5050	17.8	0.0355	0.00352	283.708	10.1
5023	9.1	0.0182	0.00181	551.978	10.0
Average Cylinder Concentration:					10.1

Previous Stated Concentration PPM: 10.2

Percent variance from Stated: 1

Meets Manufacturer Tolerance. Use manufacturers stated concentration **COMMENTS:** _____
 <=5% Outside Manufacturer Tolerance. Use manufacturers concentration _____
 > 5% Outside Manufacturer Tolerance. **DO NOT USE** this cylinder _____

Auditor: Al Clark
 Operator Signature: *Al Clark*

Date: October 19, 2016
 Location: McIntyre Center Edmonton



Calibration Gas Audit

CH4 / C3H8 Cylinder Gas

File No. 2015-092CGA

Company: Maxxam Operators name: Chris Wesson
 Cylinder #: LL165372 Conc CH4 (PPM) 606/212 Tolerance (%) 0.5 Certified By: Praxair

Reference Calibrator and Gas:

Make/Model R&R MFC 201
 Serial Number AMU 1698
 Last Verification Date January 18, 2016
 Gas Type CH4 Conc. 999.2
 Cylinder Number D751932
 Gas Type C3H8 Conc. 246.5
 Cylinder Number XF0037998

Flow Measurement Device:

Make/Model Bios DC-2
 Serial Number Bios D
 Temp. °C 24.5
 B.P. 688mmHg

Reference Analyzer:

Make/Model Thermo 55C Serial/AMU Number: 1643
 Instrument Settings Zero: NA Span: NA Range: 20.0
 Last Calibration: Date: 18-Jan-16 C.F. 1.000 Done By: SB

Calibrator Flows (scem)		Indicated Conc. (ppm)		Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration	
Dilution	Gas	CH4	C3H8			CH4	C3H8
2568	0.00	0.00	0.00	0.02140	46.722	607	214
2630	56.29	12.99	12.62	0.02140	46.722	607	214
2588	19.73	4.62	4.50	0.00762	131.171	606	215
2580	9.69	2.29	2.24	0.00376	266.254	610	217
Average Cylinder Concentration:						608	215

<u>CH4</u>	<u>C3H8</u>
Previous Stated Concentration PPM: <u>606</u>	<u>212</u>
Percent variance from Stated: <u>0.3</u>	<u>1.6</u>

Cylinder gas tolerances based on CH4 only

Meets Manufacturer Tolerance. Use manufacturers stated concentration COMMENTS: _____
 <=5% Outside Manufacturer Tolerance. Use manufacturers concentration C3H8 manufacturers tolerance 1.1%
 > 5% Outside Manufacturer Tolerance. **DO NOT USE** this cylinder

Auditor: Shea Beaton Date: January 19, 2016
 Operator Signature: _____ Location: McIntyre Center Edmonton



Calibration Gas Audit

CH4 / C3H8 Cylinder Gas

File No. 2015-091CGA

Company: Maxxam Operators name: Chris Wesson
Cylinder #: LL86139 Conc CH4 (PPM) 599/211 Tolerance (%) 0.5 Certified By: Praxair

Reference Calibrator and Gas:

Make/Model R&R MFC 201
Serial Number AMU 1698
Last Verification Date January 18, 2016
Gas Type CH4 Conc. 999.2
Cylinder Number D751932
Gas Type C3H8 Conc. 246.5
Cylinder Number XF0037998

Flow Measurement Device:

Make/Model Bios DC-2
Serial Number Bios D
Temp. °C 23
B.P. 599mmHg

Reference Analyzer:

Make/Model Thermo 55C Serial/AMU Number: 1643
Instrument Settings Zero: NA Span: NA Range: 20.0
Last Calibration: Date: 18-Jan-16 C.F. 1,000 Done By: SB

Calibrator Flows (scm)		Indicated Conc. (ppm)		Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration	
Dilution	Gas	CH4	C3H8			CH4	C3H8
2583	0.00	0.00	0.00	0.02145	46.621	597	213
2635	56.52	12.80	12.59	0.02145	46.621	597	213
2592	19.72	4.54	4.49	0.00761	131.440	597	215
2584	9.69	2.25	2.24	0.00375	266.667	600	217
Average Cylinder Concentration:						598	215

	<u>CH4</u>	<u>C3H8</u>
Previous Stated Concentration PPM:	<u>599</u>	<u>211</u>
Percent variance from Stated:	<u>0.2</u>	<u>1.9</u>

Cylinder gas tolerances based on CH4 only

Meets Manufacturer Tolerance. Use manufacturers stated concentration COMMENTS: _____
 <=5% Outside Manufacturer Tolerance. Use manufacturers concentration C3H8 manufacturers tolerance 1.1%
 > 5% Outside Manufacturer Tolerance. **DO NOT USE** this cylinder

Auditor: Shea Beaton Date: January 19, 2016
Operator Signature: _____ Location: McIntyre Center Edmonton



Calibration Gas Audit

NO Cylinder Gas

File No. 2016-336CGA

Company: Maxxam **Operators name:** Russell Kirchner
Cylinder #: LL104222 **Conc (PPM)** 50.7/50.9 **Tolerance (%)** 1 **Certified By:** Praxair
Expiry Date: July 2019

Reference Calibrator and Gas:				Flow Measurement Device:	
Make/Model	<u>Teco 146i</u>			Make/Model	<u>Bios DC2</u>
Serial Number	<u>AMU 1809</u>			Serial Number	<u>AMU 1659</u>
Last Verification Date	<u>October 19, 2019</u>			Temp. °C	<u>24.5 C</u>
Gas Type	<u>NO</u>	Conc.	<u>48.79</u>	B.P.	<u>706 mmhg</u>
Cylinder Number	<u>CAL018188</u>				
Expiry Date	<u>March 2019</u>				

Reference Analyzer:
Make/Model Teco 42i **Serial/AMU Number:** 1868
Instrument Settings **Zero:** 4.4 **Span:** 1.080 **Range:** 1.0
Last Calibration: **Date:** Oct 18/16 **C.F.** 1.000 **Done By:** Al Clark

Calibrator Flows (sccm)		Indicated Conc. (ppm)		Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration	
Dilution	Gas	NO	NOX			NO	NOX
5000	0.0	0.000	0.000				
4935	82.0	0.838	0.837	0.017	60.183	50.4	50.4
4968	40.8	0.417	0.417	0.008	121.765	50.8	50.8
4955	20.2	0.207	0.207	0.004	245.297	50.8	50.8
Average Cylinder Concentration:						50.7	50.6

	<u>NO</u>	<u>NOx</u>
Previous Stated Concentration PPM:	<u>50.7</u>	<u>50.9</u>
Percent variance from Stated:	<u>0</u>	<u>1</u>

Cylinder gas tolerances based on NO only
 Meets Manufacturer Tolerance. Use manufacturers stated concentration **COMMENTS:**
 < =5% Outside Manufacturer Tolerance. Use manufacturers concentration Contains 50.6 ppm SO2.
 > 5% Outside Manufacturer Tolerance. **DO NOT USE** this cylinder

Auditor: Al Clark **Date:** October 19, 2016
Operator Signature: *Al Clark* **Location:** McIntyre Center Edmonton

***APPENDIX III
REPORT CERTIFICATION FORM***

Report Certification Form

Alberta Airshed (if applicable)	EPA Approval or Code of Practice Registration # (if applicable)
YES	NA
Company Name (if applicable)	Industrial Operation Name (if applicable)
Lakeland Industry & Community Association	St. Lina Continuous Monitoring Station
Name of the Representative of the Person Responsible (Last, First, Middle)	Position / Title of the Representative of the Person Responsible
Maram Ghaleb	Project Manager, Customer Service, Air Services
Is an External Party Certifying the Report? (If 'Yes', fill in the fields below for the external person.)	
<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Name of External Person Certifying the Report (Last, First, Middle)	Position / Title of External Person Certifying the Report
NA	NA
Company Name for the External Person Certifying the Report	Identification of Qualifications / Professional Designations of the External Person Certifying the Report
NA	NA

I certify that I have reviewed and verified the submitted report. I also certify that the report presented with this certification form is complete, accurate and representative of the monitoring results and timeframe.

Maram ghaleb

Signature of the Representative of the Person Responsible / External Person Certifying the Report

December 1, 2017

Report Issued Date (dd-mm-yyyy)

APPENDIX IV
DATA VALIDATION CERTIFICATION FORM



Validation Certificate Form

Client: <u>Lakeland Industry & Community Association</u>	Project #: <u>2833-2017-10-31-C</u>
Site: <u>St. Lina Continuous Monitoring Station</u>	Contact: <u>Mike Bisaga</u>

Level 0 Preliminary Verification	<u>Maram ghalet</u>	Date <u>November 8, 2017</u>
Level 1 Primary Validation	<u>Maram ghalet</u>	Date <u>November 8, 2017</u>
Level 2 Final Validation	<u>Maram ghalet</u>	Date <u>November 30, 2017</u>
Level 3 Independent Data Review	<u>CSA-Lmhq</u>	Date <u>December 1, 2017</u>
Post-Final Validation	<u>NA</u>	Date <u>NA</u>

Notes
The Post-Final Validation step serves to re-evaluate the data that errors or omissions are discovered and/or suspected after the initial submittal of data. This validation is performed on an annual basis.